605 v.9

Iron and Steel Engineer

Established 1907 as Proceedings of A. I. & S. E. E.

J. F. KELLY, *Editor*

CONTENTS

Volume IX. JANUARY, 1932. Number I.

1931 and After—By William H. Warren, Vice President in Charge of Operations, Lukens Steel Company Coatesville, Pa. 1

New Uses For Steel—By J. J. Booth, Electrical Superintendent, National Tube Company, Gary, Indiana 2

The Advantages of Membership in the Association of Iron and Steel Electrical Engineers—By J. A. Clauss, Chief Engineer, Great Lakes Steel Corporation, Ecorse, Michigan 3

Trends in Combustion and Power Engineering 4

Electrical Developments in 1931 7

Main Roll Drive Statistics—1931 8

Main Roll Drives Over 300 Horse Power Purchased in 1931 9

Synchronous Motors 9
Blooming Mill Drives 10
Plate Mill Drives 10
Piercing Mill Drives 10
Tube Rolling Mill Drives 10
Strip and Hoop Mill Drives 10
Merchant Mill Drives 10
Bar and Billet Mill Drives 10
Cold Roll Mill Drives 10

Electrically Operated Crane Statistics—1931 11

1931 Operating Costs 12

Index of Electrical, Mechanical, Lubrication, Combustion and Safety Engineering Developments in the Steel Industry From 1907-1931 13

Special Magnetic Control Committee 87

Iron and Steel Industry Construction Program—1931 88

Construction Program—1932 89

Business Indicators—1930-1931 92

Items of Interest 89

Coming Meetings and Papers II

Editorial III

Index to Advertisers IV

Published Monthly by

Association of Iron and Steel Electrical Engineers

BOARD OF DIRECTORS—1931-32

President, J. J. BOOTH, Electrical Supt., National Tube Company, Gary, Ind.

1st Vice Pres., J. D. Donovan, Electrical & Mechanical Supt., Republic Steel Corporation, Massillon, Ohio.

2nd Vice Pres., W. E. Miller, Electrical Supt., Bethlehem Steel Company, Johnstown, Pa.

Treasurer, W. H. Burr, Electrical Supt., Lukens Steel Company, Coatesville, Pa.

Secretary, William Jackson, Electrical Supt., Homestead Works, Carnegie Steel Company, Munhall, Pa.

Past Pres., F. O. Schnure, Electrical Supt., Bethlehem Steel Company, Sparrows Point, Md.

Past Pres., F. W. Cramer, Chief Electrical Engineer, Republic Steel Corporation, Youngstown, Ohio.

Director at Large, J. H. Van Campen, Chief Engineer of Youngstown District, Republic Steel Corporation, Youngstown, Ohio.

Honorary Director, James Farrington, Electrical Supt., Wheeling Steel Corporation, Steubenville, Ohio.

Director, J. H. Wagner, Electrical Supt., Acme Steel Company, Chicago, Illinois.

Director, K. M. Raynor, Electrical Supt., Bethlehem Steel Company, Bethlehem, Pa.

Director, Birger Thele, Electrical Dept., Tennessee Coal Iron & R. R. Company, Fairfield, Ala.

Director, J. A. Clauss, Chief Engineer, Great Lakes Steel Corporation, Detroit, Mich.

Director, G. R. Carroll, Electrical Supt., Jones & Laughlin Steel Corporation, Aliquippa, Pa.

Director, C. C. Pecu, Lubrication Engineer, Bethlehem Steel Company, Lackawanna, N. Y.

Director, G. T. Hollett, Combustion Engineer, Illinois Steel Company, South Chicago, Ill.

Director, J. F. Hunter, Safety Engineer, Carnegie Steel Company, Pittsburgh, Pa.

Honorary Director, E. Friedlaender, Pittsburgh, Pa.

Managing Director, John F. Kelly, Empire Building, Pittsburgh, Pa.

Entered as second-class matter January 25th, 1924, at Pittsburgh, Pa., under the Act of March 3rd, 1879.
Subscription Price $5.00 per Year. Single Copy $1.00.

Coming Meetings and Papers

Combustion Engineering Division

ALL DAY TECHNICAL SESSION

G. T. HOLLETT, Chairman **T. J. ESS, Secretary**

THURSDAY, MARCH 24, 1932
OHIO HOTEL, YOUNGSTOWN, OHIO

— SUBJECTS —

"The Influence of Atmosphere and Temperature on the Behavior of Steel with Respect to Scale Losses."

"Recent Developments in Wet Method of Cleaning Blast Furnace Gas."

"Heating Furnaces for Rolling, Normalizing and Annealing in Sheet and Tin Mills."

"Mechanical Processes for Handling Sheet and Tin Plate."
a. The Combination Method.
b. The Combination System.

"Developments in Electric Motors and Magnetic Control to Handle Mechanical Processes in Sheet and Tin Mills."

PHILADELPHIA DISTRICT SECTION

SATURDAY, FEBRUARY 6, 1932

ENGINEERS' CLUB **PHILADELPHIA, PA.**

H. D. ESTERLY, Chairman **L. O. MORROW, Secretary**

"Mercury Arc Rectifiers for Steel Mill and Industrial Applications," W. E. Gutzwiller and R. W. Davis, Engineers, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

PITTSBURGH DISTRICT SECTION

SATURDAY, MARCH 12, 1932

BLUE ROOM, WM. PENN HOTEL **PITTSBURGH, PA.**

R. F. SANNER, Chairman **H. F. RAAB, Secretary**

"Recent Developments in Alternating Current Motors with Particular Reference to the Auxiliary Equipment in the Iron and Steel Industry," E. W. Henderson, Reliance Electric and Engineering Company, Cleveland, Ohio.

CHICAGO DISTRICT SECTION

WEDNESDAY, MARCH 16, 1932

ELECTRIC ASSOCIATION AUDITORIUM **CHICAGO, ILL.**

E. C. MARSHALL, Chairman **A. J. WHITCOMB, Secretary**

"Lubrication in Connection with Anti-Friction Bearings," O. L. Maag, Lubricating Engineer, Timken Roller Bearing Company, Canton, Ohio.

CLEVELAND DISTRICT SECTION

FRIDAY, FEBRUARY 5, 1932

CLEVELAND ENGINEERS' CLUB **CLEVELAND, OHIO**

A. L. FOELL, Chairman **W. W. SPANAGEL, Secretary**

"Special Motors for Quick Starting, Stopping and Rapid Reversing." (Details Later.)

Public Library
Detroit, Mich.

1931 AND AFTER?

By WILLIAM H. WARREN

Vice President in Charge of Operations, Lukens Steel Company, Coatesville, Pa.

In the parade of years, 1931 stands out distinctive as bringing with it the greatest opportunities of recent times. In a few short years we will be reading of fortunes that have been built upon the foundations of the opportunities of today by men who have had sufficient foresight to grasp them. This is true from both an industrial and financial standpoint. Combustion and power equipment may be purchased and installed at a cost that will show a handsome return on the investment and the securities at the back of American industry are certainly on the bargain counter. The "yes" man is coming into his own and the engineer with the "'no' it can't be done" complex is gradually losing ground. We need, today, more than ever "'yes' we are ready to try" men.

Most of these "yes" men have passed through the "post-graduate" period and are ready to start at forty. The professional athlete—football player, hockey player, prize fighter, wrestler,—reaches the height of his ability and is on the decline at the age of forty. Muscles of iron are no protection from death. Both Sigmund Breitbart and Eugene Sandow were victims of their own strength and died comparatively young, while Voltaire, a weakling from birth, attained the age of 84. The world has found that more dollars may be minted from brains than sweat. The mind will stand more training than the body, and to cease systematic study and allow the mind to decline at the age of forty would be the height of folly. A cursory glance at the faces of the men attending any of our Association meetings proves this point. Through at forty? Not A. I. & S. E. E. men. Technological progress has awaked our consciousness to opportunities and obligations of the future, rather than to look backward to review the work of others. Modern science has taught us to separate two liquids whose boiling points are only 2° F. apart, to use temperatures from —450° F. to 6500° F., the higher temperatures being controlled with photoelectric cells, and uniformity of temperature in a molten mass may be accomplished by one of the famous "tron" family of tubes that stir the liquid by tumbling its molecules over. Tubes which destroy the life and propagation of bacteria, protecting a volume of 30,000 cubic yards using no more power than an ordinary 50-watt lamp. In the language of the scientist, gold is simply an atom with 79 electrons around the nucleus, and our international financiers need shudder to think what may happen to the "gold standard" if we may find out how to decrease the 82 electrons of lead to 79, and so increase the 2700 cubic feet of present available gold. Pressures varying from a fraction of a millimeter of mercury to 3000 atmospheres are used in scientific work. Aeronautical instruments which allow the aviator to fly "blind", and at an altitude of 2000 feet are sufficiently accurate that he can split 10 feet.

New welding technique. Welded structural steel buildings for domestic and industrial use are an accomplished fact, and we already have welded ships, welded machine parts, welded boiler drums, fabricated welded flywheels, gears, and a host of other products until we can think of no field of metal fabrication but has been appreciably modified by this new technique.

Co-operative exchange of information has allowed the industry to benefit from individual effort and discovery. All in all, 1931 has been a profitable year for those of us who have worked for "cumulative preferred."

NEW USES FOR STEEL

By J. J. BOOTH*

New uses for steel are being developed rapidly, and welded steel especially has found a number of new uses. Welded steel structures a few years ago were considered a little radical, and the public was hesitant about reverting from the time-honored rivet. The first experimental buildings have proved that the building of the future will be a welded building, as the new type structure is fast proving its worth.

J. J. BOOTH

It remained for a Chicago architect, Henry Dubin, to apply the new principal in building to dwelling houses, and we believe that here lies a field pregnant with possibilities for the steel industry. The first welded steel frame houses have disproved the charge of its enemies, that it would be too expensive, as the cost of the steel frame houses was very little more than the wood-and-nail predecessor. Quantity production and systematized construction by trained workmen will make this house cheaper than the present type.

Actual comparative figures by the Iron League of Chicago show that the cost of erecting a house, fireproof, welded steel, brick veneer and tile interior walls costs but $24 more than a house of ordinary wood frame construction, with brick veneer. This residence, located in Cleveland, O., besides having a welded steel frame also has the steel battledeck floors.

A comparison of the cost of a welded steel dwelling in comparison with one of wood frame construction provides interesting data:

	Frame	Steel
Excavating, rough grading	$ 315	$ 315
Finish grading, lawn and drive	235	235
Masonry, cement, iron walks, stone	2,820	3,396
Structural steel	180	881
Steel sash, and screens	404	404
Carpenter labor	1,400	1,000
Rough lumber	1,185	432
Finish lumber	1,025	1,025
Floor scraping	80	80
Plastering	800	615
Wiring	335	420
Tinning	285	285
Painting	520	520
Plumbing	1,275	1,275
Heating	850	850
Ornamental iron	150	150
Tile	361	361
Mantels	40	40
Weatherstripping	28	28
Caulking	25	25
Cabinets	35	35
Composition roof	60	60
	$12,508	$12,532

The advantages of welded steel frame houses are manifest. The steel members, welded together into a single unit, provide a rigid, strong frame on which to build. No romping children will shake this house, no "settling" will crack plaster and leave gaps between wall and floor, and no misalignment of walls from warping will occur. Greater resistance to wind storms and fire should result in lowered insurance costs.

It is likely that the welded steel frame will lead to other uses of steel in dwellings. Steel frame work for windows is already common. Sheet steel manufacturers have found an outlet for their product in steel cabinets and furniture; stainless steel doors, door frames, sinks, stairways and ornamental parts combine beauty with utility.

The millions of American homes which will be built in the future offer a rare opportunity for the use of large tonnages of steel and steel products. It is for the steel industry to take advantage of it.

* Elec. Superintendent, National Tube Co., Gary, Ind., and President of A. I. & S. E. E.

THE ADVANTAGES OF MEMBERSHIP IN THE ASSOCIATION OF IRON AND STEEL ELECTRICAL ENGINEERS

By J. A. CLAUSS*

The following questions are frequently asked when we approach our associates for the purpose of having them join our Association:

What is the A. I. & S. E. E.?

Of what kind of men is its membership composed?

Who is eligible for membership?

What are the advantages of membership?

By most of our members the above questions can be easily answered, and their continued membership is an indication of their belief that the advantages obtained are worth the small effort required to retain the benefits derived by membership. Their interest ceases here. It is of little concern to them how the Association continues to live, increases its membership, and thereby its field of usefulness. It would appear that, if one is convinced of the advantages, enough to apply for membership, he would be interested enough to see that his associates, eligible for membership, also realized the advantages,

J. A. CLAUSS

and by thus increasing the membership we would enlarge our field of usefulness, which would automatically result in each member obtaining more from his membership. If each member fully realized what it is in his power to do to obtain more benefits from his membership, this article would be unnecessary.

When our associates are informed about our Association it is easy to obtain their membership. We know from actual experience that, if you are whole-heartedly interested and will tell your associates about the good work your Association is doing, you will have no trouble in increasing its membership.

The Association was started some 25 years ago by a small group of electrical engineers for the purpose of recording and exchanging experiences and opinions relating to electrical applications in the Steel Industry.

The purpose of the Association is the advancement of the application of electricity and other branches of engineering to the Iron and Steel and Allied Industries.

While the Association is primarily electric in its membership and discussions, the electrical field is so wide in its ramifications and is so interwoven into other branches of engineering, in fact so much so, that it is hardly possible today to distinguish the line where the electrical engineer stops and other branches of engineering begin. Realizing this close association of all branches of engineering, and the great good which would result from an association of men from all branches of engineering engaged in the Steel and Allied Industries, membership was provided in the various divisions of the Association for Engineers, Executives, Superintendents, and Operators. That this was a wise decision is apparent to anyone attending our Conventions or Sectional Meetings and listening to the discussions from the various divisions of our membership.

The membership of the Association is international in its scope, having members in sixteen foreign countries.

Membership can be obtained in any one of its five divisions. These divisions and the qualifications required are as follows:

Electrical Engineering Division—This Division is composed of Presidents, Managers, Superintendents, Engineers, Designers, Operators, and Consulting Engineers who have to do with the selection, design, installation, operation, and maintenance or supervision of electrical or mechanical apparatus used in the Iron and Steel and Allied Industries.

Combustion Engineering Division—This Division is composed of Presidents, Managers, Superintendents, Engineers, Designers, Operators, and Consulting Engineers whose problems have to do with the economical uses of fuel in the processing and production of Iron and Steel.

Lubrication Engineering Division—This Division is composed of Lubrication Engineers, Master Mechanics, Mechanical Engineers, Electrical Engineers, Design Engineers, and Superintendents who have to do with the selection, design, lubrication, operation and maintenance of electrical and mechanical apparatus used in

* Chairman, Membership Committee, A. I. & S. E. E. Chief Engr., Great Lakes Steel Corporation, Ecorse, Mich.

the Iron and Steel and Allied Industries. The object of this Division is the advancement of lubrication in the Industry, to promote the study and practice of steel mill lubrication and to accumulate and disseminate data secured in the field of operation.

Safety Engineering Division—This Division is composed of Presidents, Managers, Vice-Presidents, Directors of Safety, Personal and Welfare Departments, Safety Engineers who have to do with the preservation of human life, the elimination of hazards to life and property.

Junior Membership Division—This Division is composed of employees of electrical, mechanical, combustion, and safety departments who have to do with the operating or maintenance departments of the Iron and Steel Industry and who are not now eligible to any other division or class of membership.

It will be apparent that any man of good moral character engaged in the Steel Industry can qualify for membership in one of the divisions.

The Association's most effective agent for carrying on its work and delivering to each member the papers read and discussed at its various meetings is the IRON AND STEEL ENGINEER, the official magazine of the Society. It alone is worth more than the cost of the annual dues. Within its covers are recorded practically all of the major developments in the Iron and Steel Industry. Interesting papers prepared by able engineers are thus brought to the attention of all its members, and this material is available for reference in the annual bound volume containing all of the year's transactions. It is safe to say that no engineering magazine is so thoroughly read by those engaged in the Steel Industry as the IRON AND STEEL ENGINEER.

At the Association meetings and through its monthly magazine the members not only obtain all of the current information in their industries but can give voice to their own ideas and opinions.

It is a notable fact that those engineers, who have given of their time to prepare papers and discussions, have been most successful in their work. Executives and Managers realize that it requires study and work to prepare a paper, it requires courage and poise to deliver a paper, and an extensive acquaintanceship is made by an active participation in the Society's work, all of which frequently results in greater opportunities for the individual.

Enthusiasm and devotion to his profession are characteristic of the engineer. Where enthusiasm exists, love of work exists; success follows. Our individual enthusiasm is quickened by the study of the work of our brother engineers. Our monthly magazine and meetings provide the opportunity to become acquainted with our brother engineers and their work, the discussions which follow the reading of a paper bring out many hidden points, the acquaintanceship formed during the free exchange of ideas results in friendship, which are beneficial not only to the individuals but to the firms for which they are working. That this is true is evident by the fact that most progressive executives encourage the active participation in the Society's activities.

All members have equal rights in submitting papers and entering the discussions, thus is opportunity provided for the young man who is ambitious to force recognition of his ability. It should be the duty of the older members to bring this truth home to their young associates. The boys of today are the men of tomorrow, and unless we continually inject new blood into our Association, we will eventually die of dry rot.

Many will say this is not the time to start a membership drive. We believe this is the best time, because during this period we all have more time to take stock of our trade, and realizing our shortcomings, set ourselves diligently to improve our education and broaden our experience. The Association provides the means, but the individual must provide the necessary effort to improve his opportunities. It is up to our membership to show our associates the road to greater opportunities by having them join our ranks. If each member would constitute himself a committee of one to get one new member this year, we would have a healthy growth for this year.

TRENDS IN COMBUSTION AND POWER ENGINEERING

As a result of prevailing competition and the general striving for increased economy, managements are constantly becoming more and more "fuel conscious". It is becoming more generally realized that combustion departments do not constitute an expensive luxury but rather fill a definite need, and if properly supported, can effect great economies—can be made to pay dividends,—and accordingly, fuel engineers are apt to find increased responsibilities thrust upon them.

The demands which these greater responsibilities impose upon combustion engineers often call for increased versatility and ingenuity, and frequently necessitate some form of personnel education along the lines of heat generation and utilization, and in this, as in other lines, there is a decided increase in adult education. This may be in the form of correspondence courses, technical journals or trade associations and conventions, the expense of which is in some cases borne by the management. A trend of this sort cannot be commended too highly, as it is bound to be beneficial to all concerned. Developments in industry have been so rapid, and frequently result in such radical changes, that constant study is required if one is not to be left behind.

Combustion work has always been closely interwoven with metallurgy, but the development of many new processes in which the metallurgy is dependent

upon furnace atmosphere has brought even a closer relation. To intelligently cope with problems arising from work of this source, it is essential that the combustion engineer thoroughly understand these processes. The importance of this statement is very forcibly emphasized when we realize that 1% loss of steel weight in scale will approximately equal in value the fuel cost on a ton of steel.

Perhaps the oldest and most common metallurgical problem confronting the combustion man is that of scale. Perhaps it is because we have been lax in the consideration of this problem that we are guilty of those misnomers "neutral atmosphere", "reducing atmosphere", etc. And perhaps the reason for this laxity has been a decided dearth of practical information on the subject. This last requirement, however, is gradually being fulfilled. Some excellent work has been done on the factors influencing scale production, but there is yet room for further work along this line, particularly as regards the different types of scale and their characteristics. Further research on this subject should produce some very important and much-needed information.

Developments in plant equipment have proceeded gradually along the lines of increased size and economy. The stepping-up of blast furnace capacity to 1,000 or more tons per day has necessitated larger blowing units, which have been successfully supplied by the manufacturers. The demand for increased blast volume and higher blast temperatures has directed attention to hot blast stove construction. Several designs of specially shaped checker brick are now available, all of which give increased checker surface for a given volume and tend to proportion gas passage area to actual gas volume. Checkers are smaller, and heat transfer has notably improved. Increased attention is given to stove economy so as to release more gas for other purposes.

It is generally agreed that, inasmuch as boiler plants can advantageously use low grade coal whereas gas producers require a better grade of coal, the use of blast furnace gas under boilers is probably the least economical. Although the movement is slow, it is surely in the direction of application of blast furnace gas to metallurgical purposes. In the underfiring of coke ovens its lean calorific value and low velocity of flame propagation produce a more even temperature distribution than does coke oven gas, while in mixed gas systems the variable mixture, giving gas of any richness desired, adds flexibility in meeting temperature and heat transfer conditions required by the process.

The growing use of blast furnace gas as a metallurgical fuel, as well as the use of smaller checkers in hot blast stoves, has necessitated a greater degree of cleanliness in the gas. Methods of gas cleaning have improved, and tests made on modern disintegrators have shown results of even less than .01 grain of dust per cubic foot in the cleaned gas.

From its introduction in the middle of the nineteenth century, the open hearth furnace has undergone no radical change, development being mainly gradual refinement in design and increase in size. Furnace life is gradually lengthening, due to constant improvement in refractory material, and to a rationalizing of furnace design and operation. It is regrettable that, in general, fuel practice has not kept pace with improvements in furnace life. Fuel consumptions are to be found from four to seven (or more) million BTU per ton of product, and there are entirely too many bordering the high side. Much of this is due simply to thoughtlessness on the part of the operators, which must be overcome by education. From the physical standpoint, fuel practice is greatly improved by application of heat insulation to furnaces. There are many instances on record where complete insulation of slag pockets and checker chambers has reduced fuel consumption as much as 10%. Combustion control will also effect great economies, and the movement in this direction, (though lacking uniformity,) is gratifying.

Open hearth checker construction has also received attention, and several new designs of checker brick have appeared. As in blast furnace stove brick, these tend to improve heat transfer and are also designed so as to retard choking up of the checker work.

There is a gradual movement toward one-way soaking pits, which afford a longer flame travel, making possible the long, lazy flame so dear to the hearts of heaters. Complete insulation of soaking pit furnaces will result in savings approximating those in the open hearth. There is also some movement toward the use of automatic combustion control on soaking pits, which will prove very interesting.

One of the most active movements has been that of modernization of existing sheet mills. Modern sheet mill furnaces for heating, normalizing and annealing are of excellent design and produce fine records of economy, and there have been a great many installed which are almost entirely automatic. Mechanical feeding, discharging, and even automatic catching can now be had, reducing costs of sheet manufacture in a great degree.

Power station economy has gradually improved over the past few years until we have reports from central stations of less than 12,500 BTU per net KWH—somewhat less than one pound of coal per KWH sent out, or an overall thermal efficiency of about 30%. Industrial plants being smaller, their efficiency will usually be more on the order of 20%, although the 1,200 pound 110,000 KW vertical compound unit at River Rouge plant of Ford Motor Company, holding records as the most compact unit, the largest industrial unit, the largest vertical compound unit and the largest unit at that pressure should produce results equal to those of central stations.

Such units, however, are the exception in the industrial field, where generating units above 20,000 KW are rare, and pressures of 400-450 pounds seem to be favored.

Although the higher ranges of steam pressure have only recently come into use, it must not be assumed that it is entirely a new development. As early as 1825 steam generators were built for pressures of 1600-2000 pounds per square inch—in fact, more were built in that year than in 1925. Practical use, however, was not possible, due to limitations imposed by materials available at that time, and high pressure, high temperature steam was forced to wait for suitable reliable materials, and for the development of lubrication to fulfill the conditions.

Power plant installation costs have been reported

as low as $81 per KW of capacity, and one central station reports an operating force of one man per 13,333 KW capacity.

Boiler circulating systems are more complex than formerly, and may include almost any combination of water walls, ash screens, reheaters, radiant and convection superheaters and economizers. Due to the capacity of these items, the size of boiler drums is gradually shrinking. The use of water walls in particular is increasing. These reduce refractory maintenance and permit boiler ratings up to 1500% rating. A boiler furnace consisting entirely of water walls may show as much as 65% of the total heat absorption of the entire boiler occuring in the water walls.

Due to the tremendous ratings made possible by these modern boilers, a movement is on foot to change the method of rating a boiler. Certainly the old figure of 10 square feet to the boiler horsepower is obsolete, and the movement to replace it deserves the support of every member of our Association.

Though regulation of superheat has been practiced in Europe for some time, regulating devices have not met with favor in the United States. Recognizing, however, in recent years, the importance of constant superheat to turbine economy, we have rather attempted to obtain it by location of superheater units. Interdeck and inter-tube superheaters give flat characteristics, as do convection and radiant superheaters in series. Superheat temperature can also be held to some extent by a change in the gas distribution across the furnace, or by variation in the CO_2 content in the gases, though this latter method is scarcely to be commended.

Electric generators have been improved until efficiencies up to 98.5% are obtainable. Prior to 1924, 30,000-35,000 KW at 1800 RPM was considered a limit as to size, whereas we now have them up to 160,000 KW—truly a great stride, effected principally by reducing losses so more capacity can be carried with the same weight of material, by better ventilation to remove heat, and by use of materials of better physical properties, thus reducing weight.

For coal burning, the choice between stokers and pulverized fuel seems to be about evenly divided. As an auxiliary fuel, however, to make up for blast furnace gas, the flexibility and convenience of pulverized fuel has made it an easy favorite. Between unit systems and central systems for pulverized fuel, the former has the call. A newer development, the installed unit system capacity has exceeded the central system capacity since 1927, by a constantly increasing amount.

Perhaps no other development has contributed so much to improvement in all engineering lines as the great strides made in welding practice, the development of innumerable possibilities in the manufacture, installation and maintenance of combustion and power equipment. Welding is now used on boiler drums and other parts of the circulating system, furnace alloys, piping of all kinds—in short, on construction and maintenance of almost any type of equipment. The introduction of pipe fittings specially designed for welding has greatly simplified and improved the construction of piping systems.

It has been suggested that our Association work towards the setting up of standards by which to test and record the performance and efficiency of combustion units, so as to simplify comparison of results. The questions of gross tons or net, charged weight or finished, gross BTU or net, etc., enter into almost all of our data, while test results are open to almost innumerable questions. Although involving a great amount of effort and calling for much investigation, the creation of standard codes for work of this kind would seem to be a worthy activity, and should be of great benefit to the profession and to the industry it serves—certainly, this matter should be given serious thought.

Irregularity of present day operations has caused increased losses due to frequent shutting down and heating up of furnaces, gas producers, boilers, etc., for short operating periods. Fuel required for heating up will approximate the fuel used in 8 to 12 hours of operation. From this it is at once apparent that the loss in heating up may constitute a very appreciable percentage of the total fuel used for short operating periods. Scheduling of operations to reduce this loss may therefore show considerable savings in fuel, just as savings in power cost have been effected by scheduling mill operations so as to reduce peak demands and take advantage of off-peak power. This may seem a radical idea, but with economy the watchword, many practices hitherto scorned are now common, and it is by taking advantage of such things that we are able to produce results and carry on with implicit confidence as to the future.

To the Operating Personnel of the Iron and Steel Industry

The Combustion Engineering Division of the Association of Iron & Steel Electrical Engineers extends to you a cordial invitation to attend the all day technical session on Thursday, March 24, 1932, at the Ohio Hotel, Youngstown, Ohio.

Many of the subjects to be discussed are of vital economic interest, one in particular "Sheet and Tin Mill Practices" starting with Continuous Furnaces, then Mechanical processes and, finally, the Electrical Developments, all of which will save, it is claimed, as high as five dollars per finished ton.

You are urged to attend this meeting and participate in the discussion.

Yours very truly,

COMBUSTION ENGINEERING DIVISION
ASSOCIATION OF IRON & STEEL ELECTRICAL ENGINEERS.

ELECTRICAL DEVELOPMENTS IN 1931

The Electrical Departments of the Iron and Steel Industry spent approximately thirty-five million dollars in new work, maintenance and electric power during the year 1931.

Using the purchases of electrical equipment for the year 1929 as a basis for electrical modernization in steel plants, it will require twelve years to bring the Iron and Steel Industry to the point where they may consider themselves completely electrified. However, there is at least two million horsepower in the Iron and Steel Industry which is over fifteen years old and which must be coldly scrutinized, as the maintenance for this equipment runs into millions of dollars each year. The Steel Industry could, with profit to themselves, make a survey of the electrical applications that are fifteen years old, as electrical characteristics of this class of equipment are such that they do not fit into the modern program of today. For example, Main Roll Drives.

12,000	H.P.	which	was	installed	in	1905	is	26	years	old
26,000	"	"	"	"	"	1906	"	25	"	"
27,000	"	"	"	"	"	1907	"	24	"	"
12,000	"	"	"	"	"	1908	"	23	"	"
27,000	"	"	"	"	"	1909	"	22	"	"
32,000	"	"	"	"	"	1910	"	21	"	"
3,000	"	"	"	"	"	1911	"	20	"	"
32,000	"	"	"	"	"	1912	"	19	"	"
37,000	"	"	"	"	"	1913	"	18	"	"
50,000	"	"	"	"	"	1914	"	17	"	"
110,000	"	"	"	"	"	1915	"	16	"	"
162,000	"	"	"	"	"	1916	"	15	"	"

This totals 529,000 horsepower in Main Roll Drives which are fifteen years old and over.

The Iron and Steel Engineer during the past year has printed many of the electrical developments that have taken place in the Iron and Steel Industry. No effort will be made at this time to describe these developments, as these descriptions have already appeared in print in the columns of the Iron and Steel Engineer. However, as a reminder they are as follows:

Arc Welded Fabricated Steel Frame Construction for Synchronous Motors.

Insulated Aluminum Wires and Cables.

New Electric Gauge Magnifying Infinitesimal Dimensions Ten Thousand Times.

A Mercury Turbine.

A Drip Cover to protect Motors in bad Locations from Drip Water, Acid or Other Injurious Solutions.

A New Heavy Coated Electrode for Welding.

An apparatus for X-Raying Steel and Metal up to Thickness of 4½ inches.

A New Track Switch Heater for Melting Away Ice and Snow on Railroad Tracks and Switches.

A New General Utility Flood Light Projector.

A New Magnetic Controller for Lifting Magnets.

A Gas Engine Welding Set Equipment with Flanged Wheels for Track Service.

A New and Improved Mechanical Drive Turbine, 400 lb. steam pressure, 700 degrees temperature.

A One Unit Motor Generator Set.

A Dead Weight Tight Pressure Gauge.

A New Electric Driven Heavy Roll Grinder.

An Air Blast Transformer of Record Current Rating for Supplying Resistance Welded Circuits.

The Twin Motor Drive.

Synchronous Motors for Hot Tin Mill Drives.

A New Principle for Scavenging Arc Products in Oil Circuit Breakers.

Electronic Tubes for Steel Mill Applications.

The Differential Selsyn Photo-Electric Cell.

The Lighting Stroke Recorder and Search Indicator.

Synchronous Motors for Shear Drives.

A Variable Speed Drive which Combines Motor Speed Changers, Speed Reducer and the Control in a Single Housing.

Gasoline Electric Locomotive.

A 6500 KW Mercury Arc Rectifier.

A 40,000 K.V.A. Self-Cooled Transformer.

A New Potentiometer Pyrometer.

A New Line of Synchronous Motors for Driving Low Speed Constant Speed Machinery.

A Photo-Electric Recorder.

A New Line of Magnetic Clutches.

A New Magnetic Metal, 30 Times as Magnetic as Open Hearth Steel or Iron.

A New Line of Torque Motors Wound Either for DC Current or Polyphase AC Current.

Test Clamps for Fuses.

A New Safety Switch for Magnetic Contactors.

An Electric Steam Generator with Pressure Rating from 100 to 200 Lbs.

A New Line of Across-the-Line Motor Starters.

A New Photo-Electric Lighting Relay.

A New Explosion Proof AC Starter.

A Photo-electric Relay to Operator Shear for Cutting Hot Bars.

A New Line of DC Vertical Motors.

A New High Pressure Flowmeter Manometer.

A New Line of DC Motors with Re-fillable Type Commutators.

A New Line of Insulators and Auto Transformers.

A New Photronic Cell.

A New Electric Space Heater.

All Welded Locomotives.

A Flame Analyzer for Gas Coal Plants.

A New Instrument to read Illumination Intensity with the same ease as reading Ammeters and Voltmeters.

A New Line of Shoe Type Weather-proof Brakes for AC Motors.

Electrically Heated Asphalt Tanks for Dipping Pipe.

Variable Voltage Control for the Operation of Skip Hoists.

Automatic Control for the Products of Combustion Entering Blast Furnace Stacks and Stoves through the Use of Motors and Controllers.

Man Trolley Type Ore Bridge using Electro-Pneumatic Control and pneumatically released and set Spring Brakes.

Electric Automatic Open Hearth Furnace Control.

The Use of Electric Locomotives to haul ingot buggy between Soaking Pits and Blooming Mills.

A New Line of Heavy Duty Steel Mill Magnetic Controllers.

Another Electric Company Manufacturing the A. I. & S. E. E. Standard Mill Type Motor.

Electric Furnace being used in Cold Strip Mills for Nitriding and Bright Annealing.

Equipment for more Satisfactory Methods of Paralleling Generator Equipment.

Developments in Illuminating Equipment to Increase Life of Lamp and Reduce Cleaning Costs.

Improvements in Explosion Proof Motors.

A Special DC Wide Speed Range Motor for Machine Tool Work using Tungsten Carbide Cutting Tools.

A New Line of Single Operator Arc Welding Motor Generator Sets.

An Electrical Drive for a Push Bench to Produce Seamless Steel Tubes.

Electrically Operated Sheet and Tin Mill Catchers.

A New Type of Speed Regulator for Direct Current Motors in Steel Mills.

A Keyboard Type of Master Switch for Controlling Steel Mill Auxiliaries.

Many of these developments were shown in actual operation for the first time at the Iron and Steel Exposition at Cleveland, Ohio.

MAIN ROLL DRIVE STATISTICS–1931

MAIN DRIVE MOTORS SOLD 1931

ALL MOTORS 300 H.P. OR OVER

Companies	Total H.P. Purchased 1931
Allegheny Steel Company	12750
American Sheet & Tin Plate Company	1175
Amtorg for U. S. S. R.	24000
Babcock & Wilcox Company	450
Bethlehem Steel Company	4500
Great Lakes Steel Company	6250
Illinois Steel Company	300
Inland Steel Company	36500
Jones & Laughlin Steel Corporation	1800
National Tube Company	3900
Otis Steel Company	21300
Tennessee Coal, Iron & R. R. Company	5000
Weirton Steel Company	500
Republic Steel Corporation	900
Total	119325

Total Motors Purchased In Iron & Steel Industry	H.P. Per Motor
7	300
5	400
1	450
7	500
3	550
1	675
1	800
2	900
3	1000
1	1250
4	1500
1	1600
5	2000
2	2500
4	3000
10	3500
1	4000
1	4500
2	5000
2	7000
63	

VOLTAGES USED ON MAIN ROLL DRIVE MOTORS

No. Motors Purchased	Voltage
6	230 D.C.
1	250 D.C.
36	600 D.C.
3	800 D.C.
4	2200 A.C.
10	6600 A.C.
2	10000 A.C.
1	11000 A.C.
63	

MOTORS AND TYPES OF DRIVES PURCHASED IN 1931

No.	Type
9	Synchronous Motors
2	Blooming Mill Drives
3	Plate Mill Drives
1	Piercing Mill Drive
4	Tube Rolling Mill Drives
29	Strip and Hoop Mill Drives
11	Merchant Mill Drives
1	Bar and Billet Mill Drives
12	Cold Roll Mill Drives

METHOD OF DRIVE

60 Main Roll Drive Motors were geared
3 Main Roll Drive Motors were direct

COMPILATION

63 Main Drive Motors over 300 H.P. purchased in 1931
46 Main Drive Motors over 300 H.P. used D.C.
17 Main Drive Motors over 300 H.P. used A.C.
Of the 17 A.C. Motors 9 were 60 cycle, 6 were 25 cycle and 2 were 50 cycle.

Main Roll Drives Over 300 Horsepower Purchased In 1931

A Complete list of all main roll drives, over 300 H.P. installed in the Iron and Steel Industry up to the year of 1930 will be found in the 1929-30 Proceedings of the Association of Iron and Steel Electrical Engineers. Drives purchased during the year 1930 will be found in the January, 1931, issue of Iron and Steel Engineer.

H.P.	R.P.M.	Volts	Cycle	Type of Mill	Drive	Date	Name of Plant	Location	Mfgd. By
300	200-400	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
300	200-400	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
300	600-1200	230	DC	Reducing Tube Rolls	Geared	1931	Jones & Laughlin Steel Corp.	Aliquippa, Pa.	GE
300	300-900	230	DC	Bar Mill Vertical Edger	Geared	1931	Illinois Steel Co.	Gary, Ind.	W
300	400-1200	230	DC	Cold Strip	Geared	1931	Republic Steel Co.	Massillon, O.	W
300	400-1200	230	DC	Cold Strip	Geared	1931	Republic Steel Co.	Massillon, O.	W
300	400-1200	230	DC	Cold Strip	Geared	1931	Republic Steel Co.	Massillon, O.	W
400	400-1000	230	DC	Tube Mill	Geared	1931	National Tube Co.	Ellwood City, Pa.	W
400	250-500	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
400	250-500	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
400	200-400	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
400	300-1050	600	DC	Cold Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
*450	450	2200	60	Tube Reeling	Geared	1931	Babcock & Wilcox	Beaver Falls, Pa.	W
500	175-350	250	DC	Hot Strip Edger	Geared	1931	Weirton Steel Co.	Weirton, W. Va.	W
500	300-900	600	DC	4-High Cold Strip	Geared	1931	Amer. Sheet & Tin Plate Co.	Gary, Ind.	W
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	150-450	600	DC	76″ Strip S.B.	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
550	400-800	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
550	400-800	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
550	400-800	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
675	533-800	600	DC	4-High Cold Strip	Geared	1931	Amer. Sheet & Tin Plate Co.	Gary, Ind.	W
800	600	2200	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
900	300-600	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
900	300-600	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
1000	300-600	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
1000	375	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
*1000	600	6600	60	36″ Plate	Geared	1931	Tenn. Coal, Iron & R. R. Co.	Birmingham, Ala.	W
*1250	85.7	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
*1500	150	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
R1500	150-300	600	DC	Push Bench	Geared	1931	Jones & Laughlin Steel Corp.	Aliquippa, Pa.	GE
1500	200-400	600	DC	Cold Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
1500	200-400	600	DC	Cold Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
1600	600	2200	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
*2000	257	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2500	200-400	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
*2500	240	11000	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3000	150	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3000	500	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3000	500	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3000	500	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3500	175-350	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	175-350	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	175-350	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
*3500	300	2200	60	Tube Piercing	Geared	1931	National Tube Co.	Ellwood City, Pa.	W
4000	80-160	800	DC	42″ Universal Plate	Direct	1931	Tenn. Coal, Iron & R. R. Co.	Fairfield, Ala.	GE
4500	375	6600	25	160″ Plate	Geared	1931	Bethlehem Steel Co.	Sparrows Point, Md.	GE
*5000	250	10000	50	24″ Continuous	Geared	1931	Amtorg for U. S. S. R.	Magnetostroy	GE
*5000	250	10000	50	18″ Continuous	Geared	1931	Amtorg for U. S. S. R.	Magnetostroy	GE
R7000	50-120	800	DC	44″ Blooming	Direct	1931	Amtorg for U. S. S. R.	Magnetostroy	GE
R7000	50-120	800	DC	44″ Blooming	Direct	1931	Amtorg for U. S. S. R.	Kuznetsky	GE

* Synchronous Motors R Reversing Motors

SYNCHRONOUS MOTORS

450	450	2200	60	Tube Reeling	Geared	1931	Babcock & Wilcox	Beaver Falls, Pa.	W
1000	600	6600	60	36″ Plate	Geared	1931	Tenn. Coal, Iron & R. R. Co.	Birmingham, Ala.	W
1250	85.7	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
1500	150-300	6600	60	Push Bench	Geared	1931	Jones & Laughlin Steel Corp.	Aliquippa, Pa.	GE
2000	257	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2500	240	11000	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	300	2200	60	Tube Piercing	Geared	1931	National Tube Co.	Ellwood City, Pa.	W
5000	250	10000	50	24″ Continuous	Geared	1931	Amtorg for U. S. S. R.	Magnetostroy	GE
5000	250	10000	50	18″ Continuous	Geared	1931	Amtorg for U. S. S. R.	Magnetostroy	GE

BLOOMING MILL DRIVES

H.P.	R.P.M.	Volts	Cycle	Type of Mill	Drive	D	Name of Plant	Location	Mfgd. By
R7000	50-120	800	DC	44″ Blooming	Direct	1931	Amtorg for U. S. S. R.	Magnetostroy	GE
R7000	50-120	800	DC	44″ Blooming	Direct	1931	Amtorg for U. S. S. R.	Kuznetsky	GE

PLATE MILL DRIVES

*1000	600	6600	60	36″ Plate	Geared	19	Tenn. Coal, Iron & R. R. Co.	Birmingham, Ala.	W
4000	80-160	800	DC	42″ Universal Plate	Direct	1	Tenn. Coal, Iron & R. R. Co.	Fairfield, Ala.	GE
4500	375	6600	25	160″ Plate	Geared	1	Bethlehem Steel Co.	Sparrows Point, Md.	GE

PIERCING MILL DRIVES

*3500	300	2200	60	Tube Piercing	Geared		National Tube Co.	Ellwood City, Pa.	W

TUBE ROLLING MILL DRIVES

300	600-1200	230	DC	Reducing Tube Rolls	Geared	1931	Jones & Laughlin Steel Corp.	Aliquippa, Pa.	GE
400	400-1000	230	DC	Tube Mill	Geared	1931	National Tube Co.	Ellwood City, Pa.	W
*450	450	2200	60	Tube Reeling	Geared	1931	Babcock & Wilcox	Beaver Falls, Pa.	W
1500	150-300	600	DC	Push Bench	Geared	1931	Jones & Laughlin Steel Corp.	Aliquippa, Pa.	GE

STRIP AND HOOP MILL DRIVES

500	175-350	250	DC	Hot Strip Edger	Geared	1931	Weirton Steel Co.	Weirton, W. Va.	W
500	150-450	600	DC	76″ Strip S.B.	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
800	600	2200	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
1000	375	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
*1250	85.7	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
*1500	150	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
1600	600	2200	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
*2000	257	6600	60	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2000	250-500	600	DC	30″ Sheet Strip	Geared	1931	Allegheny Steel Co.	Brackenridge, Pa.	GE
2500	200-400	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
*2500	240	11000	60	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3000	150	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3000	500	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3000	500	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3000	500	6600	25	76″ Strip-Plate	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
3500	175-350	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	175-350	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	175-350	600	DC	72″ Hot Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
3500	175-350	600	DC	76″ Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	AC
*5000	250	10000	50	24″ Continuous	Geared	1931	Amtorg for U. S. R. R.	Magnetostroy	GE
*5000	250	10000	50	18″ Continuous	Geared	1931	Amtorg for U. S. R. R.	Magnetostroy	GE

MERCHANT MILL DRIVES

300	200-400	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
300	200-400	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
400	250-500	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
400	250-500	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
400	200-400	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
550	400-800	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
550	400-800	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
550	400-800	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
900	300-600	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
900	300-600	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE
1000	300-600	600	DC	Merchant	Geared	1931	Great Lakes Steel Corp.	Detroit, Mich.	GE

BAR AND BILLET MILLS

300	300-900	230	DC	Bar Mill Vertical Edger	Geared	1931	Illinois Steel Co.	Gary, Ind.	W

COLD ROLL MILL DRIVES

300	400-1200	230	DC	Cold Strip	Geared	1931	Republic Steel Co.	Massillon, O.	W
300	400-1200	230	DC	Cold Strip	Geared	1931	Republic Steel Co.	Massillon, O.	W
300	400-1200	230	DC	Cold Strip	Geared	1931	Republic Steel Co.	Massillon, O.	W
400	300-1050	600	DC	Cold Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	400-800	600	DC	Cold Strip	Geared	1931	Inland Steel Co.	Indiana Harbor, Ind.	GE
500	300-900	600	DC	4-High Cold Strip	Geared	1931	Amer. Sheet & Tin Plate Co.	Gary, Ind.	W
675	533-800	600	DC	4-High Cold Strip	Geared	1931	Amer. Sheet & Tin Plate Co.	Gary, Ind.	W
1500	200-400	600	DC	Cold Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE
1500	200-400	600	DC	Cold Strip	Geared	1931	Otis Steel Co.	Cleveland, O.	GE

* Synchronous Motors R Reversing Motors

ELECTRICALLY OPERATED CRANE STATISTICS 1931

ELECTRIC OVERHEAD TRAVELING CRANES, CHARGERS, HOISTS, PURCHASED BY IRON AND STEEL INDUSTRY

Table No. 1
Trend of Bearing Construction

Number of Cranes Purchased	Crane Tonnage	Completely Equipped with Anti-friction Bearings	Partially Equipped	Sleeve Bronze Bearings Etc.	Unclassified
2	2	.....	.....	2	.....
2	3	1	.....	1	.....
1	4	1	.....	.....	.....
10	5	4	4	2	.....
10	7½	7	.....	3	.....
19	10	14	1	3	1
1	13	1	.....	.....	.....
20	15	6	1	13	.....
6	20	5	1	.....	.....
10	25	7	.....	3	.....
3	30	3	.....	.....	.....
3	35	3	.....	.....	.....
1	40	1	.....	.....	.....
8	50	1	2	5	.....
4	60	.....	1	3	.....
2	100	.....	.....	2	.....
3	175	.....	3	.....	.....
2	220	2	.....	.....	.....
1	250	.....	1	.....	.....
108		56	13	38	1

ADDITIONAL TROLLEYS PURCHASED

Table No. 1
Trend of Bearing Construction

2	5	2	.....	.....	.....
2	10	1	.....	.....	1
1	30	.....	.....	.....	1
1	45	.....	.....	.....	1
3	75	.....	3	.....	.....
9		3	3	.....	3

8 Trolleys used D.C. Current and 1 used A.C.

Table No. 2

Type of Cranes Purchased	Total
Standard Cranes	40
Standard Cranes with Magnet	18
Standard Hook Cranes	14
Double-drum, Double-hook and Double-trolley	6
Bucket Cranes	1
Power House Cranes	1
Gantry Cranes	4
Ladle Cranes	2
Ingot Strippers	3
Open Hearth Chargers	6
Wall Cranes	2
Spout Hoist Jib Cranes	1
Stationary Hoist Crane	1
Transfer Car	1
Foundry—Hot Metal	1
Monorail Cranes	2
Unclassified	5
Total	108

ADDITIONAL TROLLEYS PURCHASED

Hot Metal	3
Standard	2
Bucket	1
Unclassified	3
Total	9

COMPILATION

Total Cranes purchased	108
Cranes completely equipped with Anti-friction Bearings	56
Cranes partially equipped with Anti-friction Bearings	13
Cranes equipped with Sleeve Bronze Bearings, etc.	38
Cranes unclassified as to Bearing Construction	1
Total	108
Additional Trolleys Purchased	9
Trolleys completely equipped with Anti-friction Bearings	3
Trolleys partially equipped with Anti-friction Bearings	3
Trolleys equipped with Sleeve Bronze Bearings, etc.	3
Total	9
Cranes equipped with Spur Gears	74
Spur and Worm Gears	11
Spur and Herringbone Gears	3
Herringbone	14
Cranes not classified as to Gearing	6
Total	108

369 Motors furnished.
On 8 Cranes, motors not listed.
Total tonnage purchased, 3,302.
Approximate value, $2,000,000.
84 Cranes used D.C. Current.
14 Cranes used A.C. Current.
10 Cranes, current not classified.

Additional Trolleys Purchased	9
Trolleys equipped with Spur Gears	6
Herringbone	2
Trolleys not classified as to Gearing	1
Total	9
Total tonnage	330

22 Motors for Trolleys only.
8 Trolleys used D.C. Current.
1 Trolley used A.C. Current.

1931 OPERATING COSTS*

COST TO OPERATE BY-PRODUCT COKE OVENS—1931

Electric Power and Steam	$ 4,180,000
Water	570,000
Repairs	1,900,000
Rebuilding Funds	1,520,000
Miscellaneous	8,360,000
Labor	13,870,000

COST TO PRODUCE PIG IRON, BLAST FURNACES—1931

Electric Power	$ 2,202,360
Steam	9,727,090
Water	2,018,830
Repairs	3,120,010
Refractories	550,590
Relining Fund	5,505,900
Miscellaneous Costs	13,397,690
Labor	22,207,130

COSTS TO PRODUCE INGOTS—1931

Open Hearth and Bessemer

Electric Power	$ 1,500,000
Steam	500,000
Water	1,250,000
Repairs	4,500,000
Refractories	10,750,000
Melting	38,500,000
Moulds—Stools	4,000,000
Furnace Rebuilding Fund	22,000,000
Miscellaneous	14,500,000
Labor	38,250,000

COSTS TO BLOOM AND SLAB INGOTS—1931

Electric Power	$ 4,400,000
Steam	200,000
Water	600,000
Repairs	6,000,000
Heating	6,200,000
Roll Fund	800,000
Miscellaneous	6,200,000
Labor	22,700,000

* Based on average practice.

COST OF ELECTRIC POWER TO PRODUCE THE FOLLOWING PRODUCTS DURING THE YEAR 1931

	K.W.H. Used	Cost
Tin Plate and Sheets	900,000,000	$7,425,000
Bars	153,900,000	1,270,000
Tube and Pipe Mills	94,752,000	783,750
Structural	78,290,000	645,892
Plates	89,480,000	738,210
Rods	72,756,000	600,237
Rails	71,280,000	598,060
Strip	240,000,000	1,980,000

OPERATING COSTS SHEET AND TIN BAR—1931

Electric Power	$ 405,000
Steam	3,375,000
Water	360,000
Repairs	2,700,000
Heating	1,125,000
Roll Funds	540,000
Miscellaneous	1,080,000
Department Labor	4,300,000

OPERATING COSTS FOR RAILS—1931

Electric Power	$ 598,060
Steam	118,800
Water	35,640
Repairs	629,640
Heating	392,040
Roll Fund	475,200
Miscellaneous	356,400
Department Labor	2,079,000

OPERATING LUBRICATING COSTS—1931

Coke Ovens	$ 200,000.00
Blast Furnaces	58,729.60
Open Hearth	125,000.00
Heavy Rolling Mills	1,800,000.00
Sheet, Tin and Strip	960,000.00
Power House Generating Stations	600,000.00
Bearings Changes	1,440,000.00

INDEX OF ELECTRICAL, MECHANICAL, LUBRICATION, COMBUSTION AND SAFETY ENGINEERING DEVELOPMENTS IN THE STEEL INDUSTRY FROM 1907-1931

The Association of Iron and Steel Electrical Engineers presents to its Membership and the Iron and Steel Industry, through its Papers and its Editorial Committee, an index of both the subjects and authors of the papers which have been presented before its various Sections for the past twenty-five years.

Twenty-eight Electrical and Mechanical Engineers met at an informal gathering on April 26th and 27th, 1907 to inspect a special exhibit of electrical apparatus for use in Iron and Steel plants and to listen to technical discussions covering matters of general interests to the Iron and Steel Industry.

Mr. James Farrington, then Electrical Superintendent of the LaBelle Iron Works at Steubenville, Ohio, suggested the formation of a national organization of the men in charge of the electrical departments of the Iron and Steel

J. FARRINGTON
Electrical Supt., Wheeling Steel Corporation, Steubenville, Ohio

Industry, to meet at stated intervals to discuss the subjects of common interest to electrical engineers and superintendents in their industry. Mr. Farrington's suggestion met with the hearty approval of the twenty-seven engineers from the Iron and Steel Industry, who were present at that meeting and, thus the Association of Iron and Steel Electrical Engineers was instituted and formed.

To Mr. James Farrington and the twenty-seven engineers, who were present at the meeting, the Association owes its present existence. It would have required quite a good deal of vision and imagination at that time to have been able to predict that the Association would grow and prosper into an international organization and that today it would enjoy the prestige and position that it now occupies in international engineering circles.

To the twenty-eight engineers, who fostered this Organization, the Papers and Editorial Committees of the Association of Iron and Steel Electrical Engineers dedicate this twenty-five year index of all the subjects and authors that have participated in the engineering discussions of the Association of Iron and Steel Electrical Engineers.

Participants in the First Meetings of the A. I. & S. E. E.

Chapman, James Finley—Colorado Fuel and Iron Company
Collins, Palmer—American Steel and Wire Company
Cox, Harry A.—Carnegie Steel Company
Davenport, R. B.—Carnegie Steel Company
Farrington, James—LaBelle Iron Works
Jelley, J. F.—Phoenix Iron Works
Jones, D. J.—Republic Iron and Steel Company
Jones, O. R.—Youngstown Sheet and Tube Company
Kittredge, Frank H.—Illinois Steel Company
Koehler, A. T.—National Tube Company
Latham, H. M.—American Steel and Wire Company
Lewis, H. A.—Alan Wood Iron and Steel Company
McFeaters, George H.—The Lorain Steel Company
McGarvey, Robt. W.—Carnegie Steel Company
McKee, Frank W.—Carnegie Steel Company
Palmer, L. R.—Jones and Laughlin Steel Corporation
Paterson, Alexander—Seneca Iron and Steel Company
Reed, Jno. C.—Pennsylvania Steel Company
Richardson, Geo. W.—American Bridge Company
Shepherd, R. R.—Inland Steel Company
Snyder, W. E.—American Steel and Wire Company
Stevens, F. W.—American Bridge Company
Sturgess, G. W.—Lackawanna Steel Company
Watters, James—Bethlehem Steel Company
Winslow, G. H.—National Tube Company
Woodhull, Fred H.—Lukens Iron and Steel Company
Woodworth, A. J.—Maryland Steel Company
Yearsley, E. W.—Midvale Steel Company

This 25 year index of the activities of the A. I. & S. E. E., has been compiled for the purpose of providing for the engineers and executives of the Iron and Steel Industry a ready reference and guide of electrical, mechanical, combustion, lubrication and safety engineering practices since 1907.

The index is arranged as follows: 1st, Authors, representing practically all of the leading engineers of the Iron and Steel Industry. 2nd, Subjects of papers which cover practically every phase of engineering practice in the Iron and Steel Industry up to and including July, 1930 and which have been printed in the A. I. & S. E. E. Yearly Proceedings. 3rd, From August, 1930 up to and including December 1931 are papers which have not at yet appeared in the Yearly Volumes. These are also listed in the 3rd section of the index according to authors and subjects.

This index reflects the ideas, opinions and experiences of the electrical, mechanical lubrication, combustion and safety engineering talent of the Iron and Steel Industry and after carefully analyzing the index the conclusion is reached that the A. I. & S. E. E. has rendered a highly specialized engineering service of inestimable value to the Iron and Steel Industry. The Board of Directors desire to thank the Editorial and Papers Committee of the A. I. & S. E. E. for this 25 year index which to the best of our knowledge and belief is the most complete comprehensive index ever printed by any engineering society.

LIST OF AUTHORS

A

Abbis, R. D., Recent Boiler Plant Installation at Edgar Thomson Works, Carnegie Steel Company. 1927—191.

Adams, L. F., Continuous Rated or 50 Degree Rise Motors. 1921—21.

Ainsworth, W. P. E., Employees Training for Combustion Work. 1928-29—484.

Albrecht, G. M., and W. H. Powell, Direct Current Armature Windings for Multi-Polar Generators and Motors Frogleg Windings. 1925—198.

Albrecht, J. H., The Thomas Flexible Coupling. 1923—206. Breaking Spindles for Main Roll Drive. 1924—634. A. I. & S. E. E. Junior Division, Elements of Commutation. 1928-29—494.

Allderdice, Taylor, Safety Engineering Division of A. I. & S. E. E. 1927—235.

Alsaker, Alfred, Outdoor Sub-Station Practice and Use of Carbon Tetrachloride Fuses. 1919—55.

Anderson, E., Ward Leonard Control as Applied to Blast Furnace Skip Hoists. 1928-29—477.

Anderson, R. E., Outdoor Substations. 1928-29—30.

Andresen, A. M., Portable Electric Tools as Applied to the Iron and Steel Industry. 1916—447.

Andrew, Kenneth, and Walter Fixter, Electric Locomotives for Industrial Purposes. 1919—283.

Andrew, W. H., Increased Requirements of Switching Equipment Due to Increased Service Capacity. 1928-29—441.

Angel, H. H., Magnetic Control for Steel Mill Auxiliaries. 1926—229.

Angel, H. H., Starting Characteristics of Steel Mill Synchronous Motors. 1928-29—539.

Arnold, Samuel, III, Selection of Electrical Equipment for Arc Furnaces Used in the Melting and Refining of Ferrous Metals. 1928-29—487.

Austin, J. B., Applying the Principles of Steel Mill Practice to Arc Welding. 1929-30—499.

B

Bacon, V. R., The Incorporation of Safety in Electric Station Design. 1928-29—615.

Bailey, B. G., Electrically Heated Soaking Pits. 1925—367.

Bailey, E. G., Combustion Control. 1924—709. Automatic Combustion Control. 1925—150.

Baker, R. L., Power Costs, 1916—24.

Baker, Ray L., and Joseph McKinley, Central Station Power Supply to Iron and Steel Industry. 1917—339.

Baldwin, Allen T., The Flaming Arc Lamp in the Iron and Steel Industry. 1914—491.

Barker, Prof. J. W., Electrical Engineering at Lehigh University. 1929-30—391.

Barnard, F. H., New Stripper for Inverted Molds. 1929-30—14.

Barrow, G. M., Mechanical Design Characteristics of High Tension Insulators. 1928-29—305.

Batesole, D. E., Mounting and Maintenance of Roller Bearings on Electric Motors. 1924—155. Ball and Roller Bearing Applications. 1927—9.

Batterman, J. J., The Fox-Multax Lamp. 1910—61.

Baud, R. V. and Himes, W. H., The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses. 1928-29—673.

Bauer, R. G., Report of Sub-committee on Illumination. 1922—662.

Baum, J. V., Stokers and Their Recent Developments. 1922—163.

Baumgarten, G. W., Installation Costs. 1929-30—414.

Beardmore, A. E., New Sheet Bar and Skelp Mill at Indiana Harbor. 1927—238.

Behrend, B. A., Gas Engine Driven Generators. 1907 Paper 18.

Beitman, B. T., Electric Power Distribution in the Steel Industry. 1922—793.

Bell, J. T. R., Selection, Installation and Operation of Anti-Friction Bearings. 1924—193.

Bellis, A. E., Electric Salt Bath Furnaces for Heat Treating. 1929-30—311.

Bennett, A. M., Arc Welding Systems. 1919—610.

Bennett, C. E., Lightning Arresters. 1920—579.

Bisler, W. E., Coke Dry Quenching Practice. 1928-29—696.

Blakeslee, D. W., Electrical Rolling Mills 1925—323. Ore Unloaders, Blast Furnaces and Skip. Hoists. 1926—503. Illumination in Relation to Safety. 1928-29—6.

Bowman, J. C., Underground Cables and Accessories. 1914—317.

Booth, J. J., Specifications and Guide Forms. 1929-30—179.

Booth, J. J., and J. A. Morgan, Inspection and Operation of Electrical Apparatus. 1919—369.

Booze, M. C., A Discussion on Refractories for Use in Steel Plants. 1926—171.

Boyce, W. H., Spacing of Heavy Capacity Low Voltage Cables. 1928-29—32.

Brackett, Q. A., The Theory and Practice of Lightning Protection. 1920—585.

Brading, C. M., and F. A. Wiley, Safety Movement in Steel Mills. 1919—255.

Bradley, Lynde, Controllers and Motor Starters. 1909—Paper 6.

Brewer, O., General Phases of Pyrometry and Temperature Control in the Steel Industry. 1924—11.

Brolinson, B. G., The Ljungstrom Air Preheater. 1924—461.

Brown, E. C., Detailing of Welded Steel Buildings. 1928-29—504.

Brownlie, David, Latest Practices in Hydraulic Valves. 1927—413.

Brunner, H. E., Application of Anti-Friction Bearings. 1924—179.

Bryant, Roger H., The Rod Mill Electrification at the South Works of the American Steel & Wire Company, Worcester, Mass. 1928-29—429. Electric Heat. 1929-30—413.

Bryden, Colby W., The Deterioration and Maintenance of Oil. 1929-30—273.

Buckwalter, T. V., Application of Taper Roller Bearings. 1924—133.

Buell, Jr., William C., The Chapman-Stein Recuperator. 1924—393. Discussion on Fuel Savings Conference. 1924.

Buhlmann, F. H., Factors Governing the Design of Roller Bearings for Roll Necks. 1927—208. Ball and Roller Bearing Applications. 1927—9.

Burnett, L. H., The Economic Value of Safety Work. 1928-29—134. Education and Safety in the Iron and Steel Industry. 1928-29—262.

Burd, F. J., and H. D. James, Electric Skip Hoists and Bell Hoists. 1917—17.

Burd, F. J., Report of Standardization Sub-committee on Control. 1920—561.

Burke, James F., Synchronous Motor Applications. 1925—30.

Burnham, George A., The Selection and Maintenance of Oil Circuit Breakers. 1925—267.

Burr, W. H., Foreign Steel Mill Practice. 1925—178. Electrical Developments in the Iron and Steel Industry. 1927—203. Progress in the Steel Industry. 1927—134. Electrical Developments During the Year 1927. 1928-29—15. Yearly Review Electrical Developments Iron and Steel Industry. 1928-29—153. Air Conditioning Equipment. 1928-29—275. Report of Electrical Developments Committee, Association of Iron and Steel Electrical Engineers. 1928-29—605. Report of the Electrical Development Committee of the Association of Iron and Steel Electrical Engineers. 1929-1930—451. Ore Handling Costs. 1923—747. Foreign Steel Mill Practice. 1925—178. The Future of Electricity in the Steel Industry, 1925, VIII. Electrical Developments in the Iron and Steel Industry. 1927—203.

Burr, W. H., and H. A. Lewis, Automatic Door Hoists for Open Hearth Furnaces. 1918—209.

Butler, R. E., Boiler Practices of 1922. 1922—561.

Butler, Ralph A., Heating of Ingots by Electricity. 1925—246.

Bye, N. C., Centrifugal Pumps with Automatic Equipment. 1928-29—279.

C

Cair, A. Excello Arc Lamps. 1910—59.

Caldwell, Paul, Control of D. C. and A. C. Motors as Applied to Cranes. 1916—229.
Callan, J. C., Centrifugal Compressors. 1908 Paper 13.
Callow, O. C., Power Generation by Blast Furnace Plant. 1925—101. Standardization of Control Diagrams. 1927—139.
Candy, A. M., Cutting Steel Mill Maintenance Costs with the Welding Arc. 1925-5. The Present Status of Electric Arc Welding. 1919-627.
Candy, A. M., and G. D. Fish, Tests of Arc Welded Structural Steel. 1927—60.
Canney, P. R., A System of Coal and Ore Bridge Traverse Control for Protection Against Wind and Skewage Hazards of Skew Type Direct Current Bridges. 1923—421.
Carrick, G. S., Combustion Control. 1925—151.
Cartwright, A. N., Safe Practices in Connection with the Operation of High Tension Power. 1927—159. Transmission Hardware and Insulation Troubles.1928-29—299.
Chaffin, R. F., Our Periodical, 1925, VII.
Chandler, Jr., W. P., Control of Pressure Gas Producers. 1924—289. Report of Electric Heat Committee for 1926—99. Combustion Section, A. I. & S. E. E., 1925, VIII.—224. Proper Combustion for Furnaces. 1928—14. Economical Combustion. 1929-30—545.
Cheney, Edward J., and B. R. Shover, Cost and Efficiency of Alternating versus Direct Current Motors for Steel Mill Auxiliaries. 1911—90.
Cheney, E. J., Automatic Speed Regulating Equipment for Induction Motors with Flywheels. 1912—115.
Cherry, R. M., Electric Galvanizing. 1929-30—289.
Churchward, A., The Plastic Arc System of Welding. 1919—603.
Clark, A. B., The Economical Generation of Electrical Power. 1921—601.
Clewell, C. E., Modern Illumination in the Iron and Steel Industry. 1912—213.
Clyde, Wm. G., Inspection Trip to Carnegie Steel Company. 1927—231.
Coey, Stewart C., Application of Auxiliary Apparatus in Iron and Steel Mills. 1914—183. The Relation of Physical Examination to Electrical Work. 1915—319.
Cogswell, W. H. The Central Station and the Electric Furnace. 1916—45.
Colcord, A. W., The Placement of Men or What the Plant Surgeon Can Do for Safety. 1928-29—438.
Cole, Gurnsey H., Orientation of Steel Rod Mills. 1925—194.
Coley, W. R., Patents. 1929-30—560.
Cone, C. F., Medium Temperature Furnace Installations 1924—747.
Connally, W. B., Recent Improvements at Gulf States Steel Company. 1928-29—573.
Conway M. J., Additions to Rolling Mills at Steubenville Plant of the Wheeling Steel Corporation. 1926—114. The Engineer and His Relation to National Progress. 1929-30—280. Chief Features of Basic Open Hearth Construction. 1929-30—318. Operation of an Open Hearth Furnace. 1929-30—394. The Executive. 1928-29—145. An Ode from the Open Hearth. 1928-29—361. Fuel Utilization Practiced in Europe. 1928-29—590. Review of Fuel Engineering During 1928. 1928-29—458. Fuels. 1929-30—548. Smoke Abatement in Industry. 1929-30—114.
Combustion Control of Open Hearths, 1925—377. Refractory Problems, By-Product Coke Plant. 1926—180.
Cooper, Nelson D., Direct Connected Hot Saws. 1927—71.
Corfield, J. D., Heat Resisting Alloys and Their Use in the Steel Plant. 1928-29—549.
Cornwell, B. A., Practical Education of Steel Mill Electricians. 1920—255, Educational Training for Electrical Employees to Increase Production. 1919—378. Motor Operated Centrifugal Pumps in Steel Plants. 1923-309.
Corrin, J. G., Care and Operation of Power Transformers. 1922—23.
Cosdon, H., Standardization of Electrical Apparatus for Cranes and Machine Tools. 1917—663.
Cotton, Alfred, and E. R. Fish, Heine Boiler Practice in 1922. 1922—572.
Cramer, Frank W., and A. A. MacDonald, Reducing Power Bills on Mine Fans with Synchronous Motors. 1922—213. Some Factors Entering into the Selection of Motors for Mine Hoists. 1923—627.
Cramer, Frank W., General Specifications for Electric Overhead Traveling Cranes—Heavy Duty Steel Mill Service. 1921—403. Report of Control Committee. 1922—621. A Few Things to Think About, 1926, X. The Automatic Blast Furnace. 1925—88. Features of the New Electrical Installations at the Cambria Plant of the Bethlehem Steel Co. 1926—278. Electrical Hazards in the Steel Industry. 1926—290. An Analysis of the Motor Bearing Problem. 1927—227. Carbon Brush Standardization. 1928-29—506. Ramifications. 1928-29—639. Twenty-sixth Annual Convention and Iron and Steel Exposition. 1929-30—403.
Crane, J. B., The Trend of Boiler Development. 1922—557. Factors which Influence the Choice of Waste Heat Boilers. 1928-29—343. Boiler Pressure Above 500 Pounds. 1928-29—179. The Economics of Combustion. 1929-30—361.
Crolius, F. J., Pulverized Firing in Steam Generation. 1921—161.
Cronk, H. C., Practical Operation of Motor-Driven Continuous Mills. 1918—35.
Crosby, F. B., The Electrical Engineer in the Steel Plant and Out. 1921—563.
Crow, T. D., Design and Application of Ball Bearings. 1924—233.
Crump, R. F., Steel Treating and its Value to the Steel Engineer. 1925—298.
Cummins, A. C., and A. R. Leavitt, Single Bucket Blast Furnace Skip Hoist Characteristics. 1923—453.
Cummins, A. C., Developments in Electrical Maintenance Shop Practice. 1924—579. The Standardized Commutating Pole Mill Type Motor. 1926—262. Experiences in the Steel Industry with the Grounded Neutral. 1928-29—104. Standardization Committee, Final Outline Dimensions for Association of Iron and Steel Electrical Engineers, Standardized Mill Type Motor, June 1, 1928. 1928-29—247. The Engineer in Industry. 1925—V.
Cummings, Robert A., Reinforced Concrete Poles. 1912—343.

D

Daniels, F. H., Stokers and Their Recent Developments. 1922—163.
Day, P. C., Herringbone Gears for Steel Mills. 1913—295. Flexible Couplings. 1923—204.
Darr, H. W., Physical Conditions of a Steel Mill as a Factor in Safety. 1928-29—282.
Davenport, R. B., Dynamic Braking. 1912—401.
Davis, F. W., Some Applications of Oxygen to Ferrous Metallurgy. 1926—427.
Davis, R. W., Flexible Couplings. 1923—216. Adjustable Speed Motor Drives. 1923—645.
Davis, R. W., J. D. Wright and O. H. Needham, Electrically Driven Reversing Mills. 1924—513.
Dean, D. W., Motor Driven Bloom Shear Without Clutch. 1926—227.
De Boos, F. A., Stokers and Their Recent Developments. 1922—163.
de Fries, Walter, Hot Metal Handling. 1929-30—543.
Dickinson, E. D., The Mixed Pressure Steam Turbine with Special Reference to the Use of the Steam Regenerator. 1912—43.
Ding, A. P., Application of the Automatic Substation to Steel Mill Service. 1928-29—490.
Dobelbower, J. C., Present Practices in Connection with Motor Driven Rollers. 1928-29—177.
Dobrin, H., Value of By-Product Gas to Industry. 1922—79.
Donner, J. W., New Methods and Practices in Selling Steel. 1928-29—603.
Donovan, J. D., Electric Furnaces. 1917—671. The Superintendent's and Foreman's Responsibility in Safety and Rehabilitation. 1927—135. A Year's Operation of Power Plant at Betty Furnace, Central Alloy Steel Corporation. 1927—500. Future Thoughts in Fuel Economy. 1929-30—408. Central Alloy Steel Corporation; High Voltage Rules, Machine Shop Safety Rules and Safety Rules Governing Locomotive Crane Operators and Brakemen. 1929-30—125.
Dreyfus, Edwin O., Prime Movers for Central Stations; Their Economic Relation. 1911—138.

Dudley, Wray, The Recognition of the Engineer as an Executive. 1928-29—475. The Static Condensers on Steel Mill Loads. 1925—106. Steam vs. Electric Driven Mills. 1920—73.

Dunn, Gano S., Mill Motors. 1907 Paper 7. Crocker-Wheeler Mill Motors. 1908 Paper 14. First Cost and Operating Expenses of Mixed vs. Exclusively Alternating Systems in Steel Mills. 1910—65.

Dunn, W. V., Alternating Current in By-Product Plants. 1921—249.

Dwight, H. B., Steel Conductors for Transmission Lines. 1916—205.

Dyrssen, Waldemar, Metal Air Heater for Industrial Furnaces. 1928-29—23.

E

Eagle, C. C., and Roy M. Walker, Recording and Controlling Instrument in the Iron and Steel Industry. 1928-29—205.

Eastwood, Arthur C., Automatic Motor Control. 1911—25. Controls and Their Advantages. 1910—Paper 5.

Eastwood, Harry W., Machine Tool Control. 1914—585.

Ebdon, H. G., Efficiency vs. Economy. 1928-29—629.

Edgar, L. C., History of the Edgar Thomson Works of the Carnegie Steel Company. 1928-29—116. Steam Generation and Utilization. 1928-29—697.

Edmunds, H. M., Gearless Speed Reducers. 1929-30—266.

Egan, F. D., Underground Transmission in a Steel Plant. 1914—295. Modern Steel Mill Crane Specifications. 1916—745. Mechanical and Electrical Analysis of 40-inch Blooming Mill Screwdown. 1924—487. Safe Practices in Connection with the Operation of High Tension Power. 1927—170. Electrical Department, Lackawanna Plant, Bethlehem Steel Company, Switching Instructions. 1928-29—34. Special Study Regarding Lubrication of Anti-Friction Bearings on Mill and Crane Motors, By Committee. 1928-29—701. Report of the Special Committee on Bearings of the Association of Iron and Steel Electrical Engineers. 1929-30—460. Report of the A. I. & S. E. E. Special Committee on Bearings. 1928-29—656.

Egan, F. D., and J. F. Oehler, The Electrical Development at the Lackawanna Plant of the Bethlehem Steel Company. 1929-30—419.

Egan, Leonard W., The Complete Electrification of the Foundry Industry. 1923—377. Electrification and Simplification—Their Effect Upon The Foundry's Future. 1926—191.

Ehrhart, R. N., Condensers and Their Auxiliaries. 1914—543.

Eib, John, Accident Prevention, Joliet Works, Illinois Steel Company. 1928-29—65.

Else, H. D., Ball and Roller Bearing Applications. 1927—9.

Elliott, A. F., Electric Mining Equipment; Its Selection, Care and Operation. 1924—871.

Ellman, Louis, Soaking Pit Covers. 1928-29—133.

Emmons, G. C., Coke Braize. 1925—133.

Erickson, F. E., Ball and Roller Bearing Applications. 1927—9.

Estep, F. L., Rolling Mill Practices, Germany, Spain, Russia. 1928-29—526. Foreign Steel Mill Practice. 1925—179.

Escholz, O. H., Some Recent Investigations in Arc Welding. 1917—697.

Evans, E. J., Fuel Applications—The Essential Factors in Furnace Design. 1925—123.

Evans, W. A. D., The Mercury-Vapor Quartz Lamp. 1913—145.

F

Falter, P. H., The Generation of Steam by Electricity. 1923—231.

Farrar, N. P., The Application of the Corduroy Crane to Industrial Plants. 1928-29—588.

Farrington, James, By-Product Coke Ovens. 1917—227.

Farrington, James, and R. H. McLain, Grab Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking. 1917—439.

Fast, Gustave. Flexible Couplings. 1923—188.

Feldmann, W. H., Power Factor Correction, Effective Power and Reactive Power. 1927—389.

Fernow, Jr., B. E., Design and Use of Lifting Magnets. 1913—101. Magnetic Brakes. 1914—611.

Finks, G. H., The Conversion of Alternating Current to Direct Current. 1924—1.

Fischer, Carl, R. E. Hall and George W. Smith, The Prevention of Scale Formation by Boiler Water Conditioning. 1924—353.

Fish, E. R., and Alfred Cotton, Heine Boiler Practice in 1922. 1922—572.

Fish, G. D., and A. M. Candy, Tests of Arc Welded Structural Steel. 1927—60.

Fisher, Frank E., Electric Industrial Locomotives. 1924—913.

Fixter, Walter, and Kenneth Andrew, Electric Locomotives for Industrial Purposes. 1919—283.

Flagg, H. V., Comparative Value of Steel Mill Fuels. 1929-30—367. Developments in the Field of Combustion. 1929-30—178.

Flaherty, T. J., Organized Inspection as an Aid to Crane Maintenance. 1929-30—448.

Flanagan, W. N., The Control of Boiler Operation. 1921—295. Bent Tube vs. Straight Tube Boilers. 1922—321. Gaseous Fuels. 1928-29—467. Report of the Gas Utilization Committee. 1928-29—693.

Fleming, R., Structural Steel Poles and Towers. 1912—358.

Foell, A. L., The Flat Suspended Open Hearth Roof. 1927—140.

Fortune, F. R., Cooper-Hewitt Lamps for Industrial Lighting. 1907 Paper 10. The Light for Safety. 1911—155.

Foss, Feodore F., Engineers, Economics and Economies. 1929-30—406.

Fox, Gordon, Auxiliary Drives. 1919—123. Considerations Concerning Auxiliary Drives. 1920—343. Electric Heating of Finishing Rolls of Sheet and Tin Mills. 1923—253. Steam vs. Electric Driven Mills. 1920—70. Electric Power in the Iron and Steel Industry Generation or Purchased. 1927—134. An Open Letter. 1929-30—167.

Frank, Carl George, Progress in the Iron and Steel Industry and the Electric Furnace. 1915—105.

Freret, A. L., Heating of Underground Cables. 1919—209. Underground Transmission. 1920—327.

Friedlaender, E., Electric Cranes for Steel Mill Service. 1911—56. Questions on Motor Drive for Main Rolls. 1913—209. Motor-Generators vs. Rotary Converters. 1915—57. Transformers for Steel Mill Service. 1911—46.

Fries, J. E., 60 Cycles vs. 25 Cycles in Steel Mills. 1918—543. Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives. 1919—671.

Frisch, Martin. Developments in Steam Making. 1928-29—442.

Fuller, R. M., Power Economy. 1929-30—109.

Funk, N. E., Interconnections of Electrical Systems. 1929-30—390.

G

Gadsby, G. M., and E. C. Stone, Central Station Power Rates. 1919—223.

Gage, Gordon—Slip Regulators vs. Notchbacks. 1920—653.

Gainsborg, E. C., Application of Anti-Friction Bearings to Roll Necks and Steel Mills. 1927—36. Anti-Friction Bearings on Roll Necks of Rolling Mills. 1927—274.

Galbraith, L. F., Report of Educational Committee. 1921—509.

Gale, R. F., Organization-Departmental. 1922—805. One Hundred Days Without An Accident. 1928-29—597.

Gary, Elbert H., Starting a Steel Mill with the Wave of a Hand. 1927—234.

Garrett, Jr., W. W., Main Hoists for Open Hearth Ladle Cranes. 1919—271. Engineering Investigation in Operating Cost Reduction. 1927—136.

Gasche, F. G., Theory of Rolling of Plastic Materials. 1929-30—505.

Gassman, H. M., Special Lighting for Steel Mills. 1911—160.

Gerhardt, R. B., Hydraulic vs. Electric Drive for Steel Mill Auxiliaries. 1919—85. Electrical Features of a Modern Steel Plant. 1920—77. Electrification of the Steel Plant Railroad. 1921—535. Some Considerations in the Electrification of the Steel Plant Railroad Yard. 1922—461. Electrical Development Committee Report for 1922. 1922—605. Records and Tests. 1919—389. Electrical Development Committee Report. 1921—497. Efficiency. 1928-29—602.

Germain, A. C., and H. G. Hensel, Instructing the New Employee in Safety. 1929-30—180.
German, H. M., Electric Melting of Alloy Steel. 1928-29—435.
Ghosh, S., Electrification of Tata Iron Works at Jamshedpur, India. 1924—545. Electrification of the Tata Iron Works at Jamshedpur, India. 1927—404.
Gill, C. S., Notes on the Damping Down and Restarting of Blast Furnaces. 1929-30—80.
Gilson, B. W., Apprenticeship System as Applied to Steel Mills. 1914—89.
Glew, John, Pulverized Coal Used as Fuel in Sheet Mills. 1924—553.
Greene, B. H., Steel Plant Power Generation from Waste Heat and Coal. 1920—21.
Greenwood, Walter, Installation of Electrical Equipment to Comply with Requirements of Safety. 1915—299. Safeguarding Electrical Equipment. 1917—253. Automatic Engine Stops. 1918—325. Standardization of Electrical Equipment and Its Relation to Accident Hazard. 1920—297. Comments on Safety Committee Work. 1921—597. Standardization of Engine Stops. 1923—355. Crane Hoist Travel Limit Devices. 1924—701. Accident Prevention. 1925—46. Guarding Against the Invisible Hazards of Electrical Installations. 1926—224. Discussion of Electrification of Plant Railroads. 1926—384. Installation and Operation of Air Compressor Plants for Avoidance of Explosions. 1927—126. The A. I. & S. E. E. and Safety. 1928-29—16. Automatically Opening and Closing Receptacles Containing Inflammable Fluids. 1928-29—444. Hoist Travel Limits on Overhead Cranes 1929-30—359. General Specifications for Construction and Installation of Automatic Engine Stops. 1923—349. Safety Rules for Government of Employees Working on Electrical Equipment. 1919—315.
Gull, John M., Safety First. 1929-30—16.
Gurney, F. W., Application of Anti-Friction Bearings. 1924—147.

H

Hague, F. T., and R. S. Marthens, Fabricated Direct Current Machines. 1929-30—117.
Hall, David, The Advantages of Modern Types of Direct Current Machines. 1916—83.
Hall, R. E., Carl Fischer and George W. Smith, The Prevention of Scale Formation by Boiler Water Conditioning. 1924—353. Some Results of Boiler Water Conditioning. 1928-29—681.
Hall, W. S., A. C. vs. D. C. Motors for Rolling Mill Table Drives. 1919—419. The Application of Electric Power in the Iron and Steel Industry. 1922—127. Mechanically Trained Electrical Men, 1925, VI.
Hall, J. H., The Automatic Control of Synchronous Motors. 1927—427.
Handy, A. E., Blast Furnace Skip and Bell Hoists. 1912—15.
Hanker, F. C., Theory of Grounding. 1928-29—91.
Hansen, K. L., Some Recent Developments in Arc Welding. 1929-30—283.
Hanson, F. A., Electric Heating Applied to the Steel Industry. 1922—837.
Harper, W. J., Open Hearth Roof Construction. 1926—179.
Harrington, James, Stokers and Their Recent Developments. 1922—163.
Harrison, Ward, Some Features of Good Steel Mill Illumination. 1911—198. The Incandescent Lamp in the Steel Industry. 1912—185. Some Recent Advances in Industrial Lightning. 1917—635. Report of Standardization Sub-committee on Illumination. 1920—569. Fifteen Years of Steel Mill Illumination—What Change. 1927—143.
Harrison, Ward, and H. H. Madgsick, A Progress Report on Illumination. 1913—241.
Harry, R. J., Crane Track Wheels and Crane Runways. 1929-30—324. Electric Overhead Travelling Crane Questionnaire and Answers. 1929-30—331.
Hayes, J. C., Foreign Practice and Some Examples of the Tendency Toward Conservation of Low Grade and Waste Gases. 1928-29—695.
Hays, J. W., The Relation of the Engineer to Fuel Conservation. 1922—395.
Heath, L. A., The Proper Selection of Carbon Brushes. 1921—51.
Hedberg, C. W., Blast Furnace Gas Cleaning. 1928-29—707.
Heitman, E., A. C. Generators and Induction Motors. 1907 Paper 8.
Heller, L. W., Steam Turbine Operation. 1922—723.
Heller, R. W., Electric Heat Treating Furnace Operating Data. 1927—11.
Henderson, C. T., Magnetic and Mechanical Control for Motors. 1907 Paper 12. New Resistance Grid-Interlocking Systems-Controlling Apparatus at Gary. 1908 Paper 8.
Hensel, H. G., and A. C. Germain, Instructing the New Employee in Safety. 1929-30—180.
Hester, E. A., and B. M. Jones, The Effect of Grounding on the Reliability of Relay Operation. 1928-29—102.
Henthorn, A. L., Application of High Duty Worm Gears in Steel Plants. 1926—75.
Hepburn, W. M., Surface Combustion and Its Application. 1923—537.
Hershberger, David C., and O. Needham, Economies of Steel Plant Railroad Electrifications. 1926—149.
Hess, L. J., Roller Bearings Applied to Mill Motors. 1922—811.
Hibben, S. G., Surveys of Lighting and Voltage in the Steel Industry. 1928-29—729.
Himes, W. H., and R. V. Baud, The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses. 1928-29—673.
Holcomb, A. B., Sheet and Tin Mills. 1920—611.
Hollis, Harry, The Magnetized Roller Conveyor. 1924—248.
Holmes, George R., Application of Anti-Friction Bearings to Steel Mill Machinery. 1926—16.
Holslag, C. J., Electric Arc Cutting and Welding. 1919—618. Modern Structural Industry Demands a Knowledge of Arc Welding. 1928-29—35.
Hopper, D. C., Hardware and Insulators. 1928-29—297.
Hood, C. F., Ductless Electric Power Cables. 1927—45.
Hornlein, Wm. H., Central Station Power. 1917—667.
Howe, James F., Wire Rope and its Relation to Steel Making. 1915—113. A Discussion of Present Day Wire Rope Problems. 1925—168.
Huessener, K., The Slagging Producer in Steel Works. 1924—669.
Huey, Ray S., The Value of Records to an Operating Engineer. 1916—343.
Hughes, Grover, Arc Welding. 1928-29—467. Spot Welding. 1924—597.
Hughes, T. E., Safe Practices in Connection with the Operation of High Tension Power. 1927—167.
Hull, R. C., The Application of Storage Batteries to Iron and Steel Mills. 1908 Paper 10.
Humphrey, George S., Experience of a Public Utility with Grounded Neutral. 1928-29—98.
Hunt, C. H., Engine vs. Motor Drive for Reversing Blooming Mill. 1924—547. Performance and Costs of Operating Fireless Steam Locomotive in Shuttle Service at a Steel Plant. 1929-30—82.
Hurme, E. A., Medium and Low Temperature Applications. 1924—771. Factors Involved in the Selection of Direct-Connected and Geared Main Roll Drives. 1925—49. Electric Heat Treating Furnace Applications. 1925—229.
Hussey, R. M., Electrical Installations at Aliquippa Plant of the Jones & Laughlin Steel Corporation. 1927—448. Rules and Regulations Pertaining to Operation of a Steel Plant High Tension System. 1928-29—197. The Electrical Superintendent. 1928-29—639. Short Circuit Study Applied to a Steel Plant Power Transmission System. 1929-30—31.
Huston, C. B., Selection of Motors for Main Drives of Merchant, Bar and Rod Mills. 1928-29—160.

I

Iverson, L., Manipulators for Blooming Mills. 1926—272.

J

Jackson, J. A., Operation of Series Motors in Parallel When Rigidly Coupled to the Same Load. 1927—423.
Jackson, R. P., Lightning Protection. 1907 Paper 13.
Jacobus, D. S., High Pressure Steam Boilers. 1923—753.

James, H. D., Control of Motor Driven Auxiliary Apparatus in Steel Mills. 1908 Paper 5. Recent Improvements in Industrial Control. 1919—447.
James, H. D., and F. J. Burd, Electric Skip Hoists and Bell Hoists. 1917—17.
Jefferies, E. A. W., The Influence of Cheap Oxygen on Economy of Fuel and of Time. 1921—329.
Jefferies, E. S., Operating Characteristics of an Electric Reversing Blooming Mill. 1916—309. Steam vs. Electric Driven Mills. 1920—57. Electrical Development Committee Report for 1920. 1920—381. Anti-Friction Bearings for Auxiliaries in the Iron and Steel Industry. 1928-29—184.
Jones, B. M., and E. A. Hester, The Effect of Grounding on the Reliability of Relay Operation. 1928-29—102.
Jones, B. M., Relation Between Central Stations and Steel Plants in Connection with Protective Equipment. 1928-29—52.
Jones, J. W., Progress in Instruments and Control. 1928-29—654. Fuel for Continuous Normalizing Furnaces. 1928-29—696.
Jones, Lloyd, Mills of the Backed Up Type Remove Cold Rolling Limitations. 1927—498.
Jones, Noble, Strip Steel and Mills for its Production. 1926—40.

K

Keating, T. E., Some Economic Considerations in Design of Power Plants for Steel Mills. 1920—455.
Keenan, W. F., Jr., Economizers. 1928-29—669.
Keil, R. H., Current Limiting Reactances. 1920—481.
Keim, L. H., Flexible Couplings. 1923—225.
Keller, W. D., Some Modern Types of Steel Mill Cranes. 1927—244.
Kelly, H. D., Thermit Welding. 1925—5.
Kelly, J. M., Ball and Roller Bearing Applications. 1927—9.
Kendall, E. H., New Types of Soaking Pit Cranes. 1907 Paper 6. Latest Development of Electric Cranes for Steel Mills. 1915—281.
Kennedy, Walter C., Electrical Resistance Materials. 1921—241. Heroult Electric Furnaces. 1917—287. Control of Mill Tables and Screw-Downs. 1920—223. 120-in. Motor Driven Plate Mill. 1923—39. Electrical Development Committee Report for 1923. 1923—523.
Kenyon, A. F., Main Drives 10" Merchant Mill at McKinney Steel Company. 1927—455. The Selection of Main Drive Motors for Strip and Skelp Mills. 1928-29—190. Steel Plant Developments, 1928. 1928-29—459. Electrical Drives for Steel Plants. 1929-30—189.
Kieft, E., Strength of Gear Teeth. 1926—247. Steel Production and Fuel Consumption. 1926—298. Blast Furnace Flue Dust and Blast Furnace Control. 1927—241 Rolling Mill Analysis. 1929-30—438.
King, L. J., Electric Repair Shop Practices of the Pittsburgh Railways Co. 1925—355.
Kinkead, R. A., Some Practical and Theoretical Considerations in Design of Electric Arc Welding Apparatus. 1919—614.
Kinney, S. P., Physical and Chemical Conditions in the Interior of the Blast Furnace. 1929-30—104.
Kinney, S. P., and R. H. Sweetser, Modern Blast Furnace Theory and Practice. 1929-30—100.
Kinsloe, Charles L., The Application of the Principle of Surface Contact to Industrial Haulage. 1915—441.
Kirschberg, H. L., Report of Standardization Sub-Committee on Illumination. 1921—489.
Kittredge, F. H., The Evolution of Electrification in the Manufacturing Industry. 1929-30—411.
Klein, C. J., Manipulators for Two-High Reversing Blooming Mill. 1926—274. Bearings for Use in Rolling Mills. 1927—149.
Kniveton, James, The Electric Annealing Furnace. 1929-30—305.
Kneass, Jr., Strickland, Heating Furnaces — Brier Hill Sheet Mill. Youngstown Sheet and Tube Co., 1925—85.
Kyser, Nelson H., Correction of Unsafe Practices in Foundries. 1928-29—409.

L

Lamme, B. G., Some Electrical Problems Practically Considered. 1914—13. Frequency Problem in the Steel Industry. 1921—69.
Lamme, B. G., and W. Sykes, A Review of Steel Mill Electrification. 1922—583.
Lammers, Jr., E. S., Automatic Control of Reversing Rolling Mill Equipment. 1920—137. Report of Standardization Sub-committee on Cranes. 1920—539.
Lange, C. W., Factors Affecting the Application of Carbon Brushes to Direct Current Machines. 1928-29—509. The Application of Roller Bearings to General Electric Company, M. D. Motors. 1928-29—664.
Lankton, Clark S., Purchased Power for Steel Mills. 1915—193.
Lanphier, R. C., Watthour and Ampere-Hour Meters and Their Applications in Steel Mills. 1914—419.
Lapp, G. W., Dirt on Insulators. 1928-29—308.
Lavine, Saul, Switchboards and Switching for Steel Mills. 1914—133.
Lawrence, H. F., Stokers and Their Recent Developments. 1922—163.
Leahy, F. E., Fuel Requirements of Steel Mills. 1921—341. Gas Producer Operation. 1926—181. Gas Producers. 1929-30—1.
Leavitt, A. R., and A. C. Cummins, Single Bucket Blast Furnace Skip Hoist Characteristics. 1923—453.
Leavitt, A. R., Report of Standardization Sub-committee on Transmission. 1922—665.
Legon, William D., Underground System of Distribution. 1912—297.
Leilich, F. T., Seleetion of Drive for Power Plant Auxiliaries. 1927—115.
Levin, I. H., Simultaneous Production of Oxygen and Hydrogen. 1923—117.
Lewis, H. A., and W. H. Burr, Automatic Door Hoists for Open Hearth Furnaces. 1918—209.
Lewis, W. E., A Brief Review of Electric Iron and Steel Furnace Practice During 1927. 1928-29—5.
Lewis, W. W., Transmission Line Insulation and Overhead Ground Wires. 1928-29—301.
Lichtenberg, Chester, Automatic Electric Stations for Steel Mills. 1924—252.
Lincoln, J. F., Arc Welding. 1912—133. Arc Welding and the New Market for Rolling Mill Shapes. 1928-29—81. Arc Welding is Selling Steel. 1928-29—290. Electric Welding of Heavy Materials. 1929-30—296.
Lincoln, P. M., Advantages of Motor-Generator Sets and Rotary Converters for D. C. Systems. 1907 Paper 14. Recent Developments in Power Generating Apparatus. 1915—45. Reminiscences of Niagara. 1916—487. Overload Protection for Motors. 1919—525.
Lindemuth, L. B., and Geo. H. Schaeffer, Electric Furnaces. 1918—609.
Lindemuth, L. B., The Metallurgy of Electric Furnace Steel Process. 1918—609.
Lindquist, David L., Recent Developments of Electric Skip Hoists and Bell Hoists for Blast Furnaces. 1918—43.
Little, G. M., Carbon Brushes for Motors and Generators. 1928-29—514.
Llewellyn, F. T., Direct Current Metal Arc Welding. 1928-29—411.
Lorenzi, Otto De, Modern Trends in Stoker Design. 1929-30—61.
Ludwick, H. M., Adventures in Lubrication. 1927—419.
Lum, W. O., A.C. and D.C. Magnetic Control for Auxiliary Motors. 1914—239.
Lynch, T. D., Babbitts and Babbitting. 1920—161.

M

MacCutcheon, A. M., Cost vs. Upkeep of Direct Current Motors. 1916—371. Anti-Friction Bearings in the Steel Mill. 1921—429. Motor Rollers. 1928-29—37. Carbon Brush Standardization as Viewed by a Designing Engineer. 1928-29—507.
MacDonald, A. A., and Frank W. Cramer, Reducing Power Bills on Mine Fans with Synchronous Motors. 1922—213. Some Factors Entering into the Selection of Motors for Mine Hoists. 1923—627.
Madgsick, H. H., and Ward Harrison. A Progress Report on Illumination. 1913—241.
Mahoney, F. D., and Merrill Skinner, The Steel Industry and the Electric Utilities. 1924—651.
Mahoney, J. N., Recent Developments in Switching Devices for Power Circuits. 1913—77.
Mallison, E. P., Steel Mill Lubrication. 1928-29—327.
Mandeville, Lee H., Departmental Organization. 1922—797.

Manker, F. C., Some of the Business Aspects of the Furnace Manufacturer. 1929-30—132.
Marti, O. K., The Parallel Operation of Mercury-Arc Rectifiers, With Each Other, With Rotary Converters and With Motor Generators. 1927—353.
Martindale, E. H., Manufacture, Selection, and Use of Carbon Brushes. 1917—399.
Marsh, Thomas A., The Tempering of Coal. 1923—367. Stokers and Their Recent Developments. 1922—163.
Marthens, R. S., and F. T. Hague, Fabricated Direct Current Machines. 1929-30—117.
Matthewson, J., Cranes for Steel Mills. 1929-30—28.
McCarty, R. A., Some Fundamental Considerations of Power Factor Correction. 1918—19.
McDermott, G. R., Waste Heat Utilization for Steam Generation. 1921—357. The Application of Blast Furnace Gas and Air for Blowing a Gas Producer. 1925—269. Recent Developments in Industrial Furnace Design. 1929-30—534.
McEachron, K. B., The Effect of Grounded Neutral on the Efficiency of Lightning Protection Equipment. 1928-29—95.
McElhinney, E. L., Mechanical Installations-Brier Hill Sheet Mill. Youngstown Sheet and Tube Co., 1925—82.
McGurty, W. J., Blast Furnace Gas Cleaning. 1928-29—705.
McKee, F. W., An Electrically Operated Central Pumping Station. 1911—125.
McKibben, Frank P., Specifications for Welding Steel Buildings by Electricity. 1929-30—86. Structural Steel Welding. 1929-30—321.
McKinley, Jos., The Use of Central Station Power Service in Steel Mills. 1916—505.
McKinley, Jos., and Ray L. Baker, Central Station Power Supply to Iron and Steel Industry. 1917—339.
McLain, R. H., and James Farrington, Grab Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking. 1917—439.
McLain, R. H., Bridge Motors for Overhead Traveling Cranes. 1918—347.
McMillan, L. B., Insulation of Hot Surfaces and Furnace Walls. 1925—158. The Insulation of Open Hearth Furnace Regenerators. 1928-29—199.
McShane, Phelan, New and Interesting Auxiliary Motor and Control Applications. 1926—328. Foundry Electrification. 1927—126.
Menk, C. A., Electrical Repair Shop. 1919—381. Electrical Installations, New Structural Mills, Homestead Steel Works, Carnegie Steel Co., Munhall, Pa. 1927—214. Apprentice Systems. 1916—615.
Merkt, G. A., The Isley Furnace Control. 1928-29—556.
Merrick, E. G., Effect of Transient Phenomena on the Design and Selection of Alternating Current Equipment. 1928-29—263.
Milliken, J. H., Power Rectifiers. 1921—645. Cleaning Air by the Adhesive Impingement Method. 1929-30—55.
Mills, George P., Electric Annealing and Heat Treating Furnaces. 1921—1. Essentials of Design of Electric Industrial Furnaces and Their Application to Leveling up Load Curves. 1925—11.
Minty, John, Spring End Trucks for Cranes. 1929-30—59.
Mitchell, A. F., Discussion in Connection with Heating Furnaces. 1924—571.
Moore, Edward T., Report of Electric Furnace Committee for 1920. 1920—497. Electric Furnace Committee Report. 1921—587. Electric Furnace Phenomena. 1923—569.
Moore, Henry T., Centrifugal Purification of Oil. 1928-29—331.
Morgan, J. A., and J. J. Booth, Inspection and Operation of Electrical Apparatus. 1919—369.
Morgan, M. H., Adjustable Speed Main Roll Drives. 1928-29—362. Steel Plant Lighting. 1929-30—11.
Morse, F. L., Silent Chain Power Transmission . 1914—465.
Mortensen, N. L., Controllers for Ore Unloaders and Ore Bridges. 1923—1. Direct Current Hoist and Trolley Control for Ore Bridges. 1924—879. Inductive Time Limit Control. 1927—396.
Muir, R. C., Low Pressure Turbines in Steel Plants. 1909 Paper 9. Steam Turbines in Iron and Steel Plants. 1910—56.
Mundo, C. J., Iron and Steel Works Illumination. 1911—165. Curves and Data for Illumination Calculations. 1912—188.
Munro, D. J., Electric Locomotive for Hot Mill Service. 1927—236.
Murray, J. S., Anti-Friction vs. Sleeve Bearings. 1924—139. Electrification of Sheet Mills. 1927—73. Anti-Friction Bearings for Electric Motors. 1928-29—185.

N

Needham, O., and David C. Hershberger, Economies of Steel Plant Railroad Electrification. 1926—149.
Needham, O. H., J. D. Wright, and R. W. Davis, Electrically Driven Reversing Mills. 1924—513.
Needham, O., Observations on Rolling Mill Drives in Continental Europe. 1925—187.
Neville, J. J., Discussion on Steam Connection to Damper Regulators. 1927—486.
Newton, G. J., Underground Distribution Systems. 1916—171.
Newton, R. H., The Selection and Application of Direct Current Brushes. 1928-29—531.
Northwood, John, Bethlehem Steel Company's New Gautier Mills from a Safety Standpoint. 1926—309.
Nusim, M. I., Mixed Flow Turbines. 1916—601.
Nye, Ralph D., Electrical Reversing Blooming Mills. 1917—531. Present Status of Electric Furnaces in the Steel Industry. 1919—481.

O

Oartel, John A., How the Electrical Engineer and the Safety Enginer Can be Mutually Helpful. 1925—354. The Contribution of Safety to the Iron and Steel Industry. 1928-29—148. The By-Products of Safety. 1929-30—409. The Big Four of Safety. 1926—XIII.
Oehler, J. F., and F. D. Egan, The Electrical Development at the Lackawanna Plant of the Bethlehem Steel Company. 1929-30—419.
Oschmann, W. O., A Synchronous Condenser Installation for Power Factor Correction and Voltage Regulation. 1914—109. Power Accounting. 1917—163.
Osgood, H. W., The Electrical Features of Hog Island Ship Yard. 1919—33.
Ostrander, J. R., Automatic and Remote Controlled Sub-Stations as Applied to Steel Mills. 1922—365.

P

Palmer, Lew R., Organized Safety. 1914—447.
Parmiter, O. K., Uses of Electricity in the Development and Manufacture of Tool Steel. 1929-30—293.
Patterson, R. F., Improving Non-Condensing Power Plant by Use of Direct Current, Mixed Pressure Turbine Equipment. 1915—153.
Pauly, K. A., Application of Large Motors to Reversing and Non-Reversing Rolling Mills. 1907 Paper 4. Variable Speed Drives for Main Rolls of Steel Mills. 1913—267. Some of the Latest Developments in Electrical Equipment. 1915—81. Standardization of Ratings of Large Rolling Mill Motors. 1918—447. The Electric Reversing Mill Considered from the Standpoint of Tonnage. 1920—415. Steam vs. Electric Driven Mills 1920—54. New Developments in Electric Apparatus. 1909—Paper VII.
Payne, Harold J., How Electric Industrial Truck and Tractor Equipment is Effecting Savings in the Iron and Steel Industry. 1926—162.
Peebles, T. A., Combustion Control. 1925—149. Stokers and Their Recent Developments. 1922—163. Utilization of Fuel in Great Britain. 1928-29—587.
Pendleton, D. D., Condensers and Condenser Engineering Practice. 1918—385.
Penman, J. R., Motor Driven Accumulator Pumps. 1923—44.
Penniman, Jr., A. L., and F. W. Quarles, Auxiliaries and Auxiliary Drives for Steam Electric Generating Stations. 1925—255.
Peterson, E. G., Full Reverse A.C. 2 Speed Mill Controller. 1926—308.
Petry, Walter, Steel Plant Maintenance by Autogenous Welding. 1921—679. Organizing Welding in the Steel Plant. 1925—21.
Pettibone, W. W., The Efficient Burning of Fuel and Use of Waste Gases in Iron and Steel Plants. 1922—49.

Petty, D. M., Some Electrical Applications in Steel Mill Practice. 1915—233. Alternating Current Phase Wound Motors vs. Adjustable Speed Direct Current Motors. 1916—719. Electric Drives for Reversing Rolling Mills. 1917—361. Transmission and Distribution of Power in Industrial Plants. 1920—309. Power Generation in Steel Mills and its Relation to Frequency. 1921—199. General Specification for A.C. Motors for Main Roll Drives. 1921—479. Report of Standardization Sub-Committee on Motors. 1920—555, 1922—673. Electrification of Industrial Plants Railways. 1922—153. Internal Combustion Engines for Power Generation in Steel Plants. 1922—709. The Liquid Slip Regulator or Rheostat. 1923—485. Report of Special Bearings Committee. 1923—499. Ball and Roller Bearings. 1924—131. What Price Certitude. 1927—138. Conservative Economy in Power Service. 1928-29—146. The Application of Anti-Friction Bearings to Roll and Pinion Necks. 1928-29—288.

Pilliod, J. J., Effect of Grounding on Telephone Interference. 1928-29—82.

Pirtle, C. V., Magnetic Switch Controllers. 1907 Paper 11. A Steel Mill Starter for D.C. Motors. 1909 Paper 4. Consideration of Safety in the Design of Standard Apparatus. 1910—22.

Place, A. G., Overload Protection on Cranes. 1919—545.

Poole, E. J., Improvements at the Plant of the Carpenter Steel Co. During the Last Decade. 1926—9.

Pomp, A., Experiences with Electrical Bright Annealing Furnaces. 1927—377.

Potter, W. B., and G. H. Shapter, Yard Switching and Mill Transportation. 1926—144.

Powell, J. A., Design and Test of Susquehanna Station, Metropolitan Power Co. 1926—48.

Powell, W. H., and G. M. Albrecht, Direct Current Armature Windings for Multi-Polar Generators and Motors —Frogleg Windings. 1925—198.

Poynton, W. P., The Selection and Operation of Carbon Brushes. 1913—9.

Pragst, E., and David B. Rushmore, Generating Station Development. 1922—461.

Pragst, Ernest, Parallel Operation of D.C. Generators and of D.C. Generators with Synchronous Converters. 1927—358. Steam Turbine Development. 1927—39.

Pratt, H. P., The Measurement of Electricity as Applied to Industrial Plants. 1925—349.

Price, W. H., Grounding the Neutral for D.C. Distribution Systems. 1919—305.

Proudfoot, C. S., The Value of Efficient Service Departments to the General Manager. 1928-29—601. President A. I. & S. E. E. During Year 1929. XVI.

Pumley, M. S., The Accomplishments and Possibilities of the Oxy-Acetylene Process. 1912—151.

Q

Quarles, F. W., and A. L. Penniman, Jr., Auxiliaries and Auxiliary Drives for Steam Electric Generating Stations. 1925—255.

R

Randorf, Charles A., Design of Structures for Steel Works. 1916—427.

Rapelye, H. A., Direct Current Turbine Generating Units. 1913—51.

Raynor, Kenneth M., Power Transmission in Industrial Plants. 1922—1.

Rea, N. L., Maintenance of Electric Motors. 1926—288.

Read, E. K., and M. J. Wohlgemuth, Selection and Maintenance of Oil Circuit Breakers. 1925—288.

Reed, C. B., Electricity Applied to the Mechanical Mining of Coal. 1919—179.

Reed, John C., Electricity in the Iron and Steel Industry. 1925—307.

Reichert, A. L., The Rehabilitation of Steel Plants. 1927—138. Electrical Progress in Steel Plants. 1928-29—145.

Renkin, W. O., Application of Pulverized Coal to Metallurgical Furnaces. 1929-30—19.

Reynolds, H. R., Ball Bearing Applications and Maintenance. 1924—167.

Reynolds, H. E., Ball and Roller Bearing Applications. 1927—113.

Rhodes, E. F., Electrical Installations-Brier Hill Sheet Mill. Youngstown Sheet and Tube Co. 1925—84.

Rice, Owen R., Certain Principles in the Extended Use of Blast Furnace Gas. 1928-29—568.

Rice, Richard H., Turbo-Generators. 1917—479.

Richardson, G. W., Heavy Starting and Heavy Duty D.C. Motors in Steel Plants. 1907 Paper 2. Electric Motors for Heavy Torque and Rapid Reversals. 1908 Paper 3. Rules for Crane and Motor Operators to Avoid Accidents. 1909 — Paper 2. Direct Connected Reversing Motor Drive for Planers. 1911—43. Mechanical and Electrical Operation of Heroult Electric Arc Furnaces. 1916—399. Dynamic vs. Mechanical Braking. 1921—265. Electric Crane Wiring Diagram. 1923—36. Worm Gearing for Electric Cranes. 1925—87.

Rippl, C. H., W. H. Williams and L. A. Watson, The Invisible Relay in Vari-Time Control. 1928-29—270.

Roantree, T. C., Micarta Non-Metallic Gears in the Steel Mill Industry. 1928-29—407.

Roberts, S. N., Remodeled and Electrified Rod Mill. 1925—24.

Robinson, T. W., The Economic and Social Development of the American Iron and Steel Industry. 1927—477.

Rose, George E., and F. M. Washburn, The Use of Mixed Gas (Blast Furnace and Coke Oven Gas) on Open Hearth Furnaces at Wisconsin Steel Works. 1929-30—574.

Rowan, John S., Standardized Mill Table Controllers. 1918—169.

Rowe, Frank H., The Future of Safety. 1928-29—150.

Rowland, D. H., Protection of Transmission Lines. 1928-29—312.

Runyon, W. M., Portable Electric Tools in the Steel Industry: Ground Them for Safe Operation. 1928-29—692. Electrical Safety Circuits—Their Uses and Construction. 1927—248.

Rush, R. M., The Modern Sectional Header Boiler. 1922—569. Alternating Cutting Arc Welder. 1919—623.

Rushmore, D. B., Apparatus Built by the General Electric Co. for Mill Service. 1907 Paper 3. New Aluminum Steel Lightning Arresters. 1908 Paper 11.

Rushmore, D. B., and E. Pragst, Generating Station Development. 1922—473. Advantages of Central Station Power Over Steel Plant Generation.

Ryan, F. J., Combustion Control for Industrial Furnaces. 1927—493.

S

Sanner, R. F., Steel Mill Lighting Problems. 1929-30—552.

Sawdey, Roy S., Electric Furnace Installation. 1924—725. Electrification. 1926, XIII.

Sawtelle, E. S., Tool Steel Gears and Pinions for Mill and Industrial Service. 1917—517. Crane Track Wheels. 1929-30—364.

Schaeffer, George H., Report of Electric Furnace Committee. 1924—731. Report of Electric Heat Committee for 1925. 1925—228. Activities of A. I. & S. E. E. 1924—731. The Electric Furnace from the Electrical Standpoint. 1918—623. Report of the Committee on Electric Heat. 1928-29—233. Report of the Electric Heat Committee of the A. I. & S. E. E. for the year 1928—29—1929-30—67. Developments in Electric Heat. 1927—186.

Schaeffer, George H., and L. B. Lindemuth, Electric Furnaces. 1918—609.

Schnure, F. O., Electric Transportation. 1923—335. Application of Synchronous Motors to Continuous Mills. 1925—86. The Generation of Electrical Power Using Waste Heat. 1925—296. Third Rail Locomotive for Yard Service. 1924—250. Steel Mill High Tension Practice. 1928-29—182 . Recent Developments at Sparrows Point. 1928-29—470.

Schreiber, E., Tests with an Electrical Bright Annealing Furnace. 1927—379.

Schultz, H. A., General Safety Movement and Accident Prevention. 1917—45.

Schwarz, Fred J., Frequency Converters for Interchange of Power Between Steel Mills and Central Stations. 1926—79.

Scott, Charles F., Some Important Phases of Electric Power for Steel Mills. 1909 Paper 3.

Scott, Wirt S., The Electric Furnace for Annealing, Treatment, and Forging of Steel. 1918—193. The Tangible Advantages of Electric Heat Treatment. 1929-30—289.

Seede, J. A., New Mill Type Motor. 1907 Paper 5. Electric Furnaces. 1909 Paper 8. Electric Melting Furnaces. 1924—735. Electric Melting Furnaces. 1925—240.

Seibert, H. C., Economical Use of Fuel in the Steel Plant. 1923—661. Steam vs. Electric Driven Motors. 1920—35. Mixed Gases. 1928-29—4.

Seiders, I. A., The Maintenance of Locomotive and Rolling Equipment of the Reading Company. 1927—29.

Sennhauser, Walter, Dry Quenching of Coke. 1928-29—118.

Serrell, John J., Flexible Couplings for Steel Mills and Other Drives. 1923—177.

Shadgen, J. F., Combustion Control and Regulation. 1928-29—50.

Shapter, G. H., and W. B. Potter, Yard Switching and Mill Transportation. 1926—144.

Shea, Patrick, The Man in the Mill. 1928-29—412.

Shirk, W. B., Parallel Operation of Synchronous Converters for Steel Mill Applications. 1927—356. Renewal Parts and Renewal Part Records. 1926—293.

Shoemaker, R. S., Growth of the A. I. & S. E. E. 1926, IX. Our Twentieth Annual Convention. —1925, VI.

Shoudy, W. A., The Application of Pulverized Coal to Industrial Furnaces. 1928-29—123.

Shover, B. R., and Edward J. Cheney, Cost and Efficiency of Alternating vs. Direct Current Motors for Steel Mill Auxiliaries. 1911—90.

Shover, B. R., Discussion of Paper on Steel Works Illumination. 1911—194. Power in the Iron and Steel Industry. 1924—639. Steam vs. Electric Driven Mills. 1920—67. The Rolling Mill in 1927. 1928-29—2. Iron and Steel Plants Review. 1928-29—455.

Sibley, E. D., Electric Heating with Special References to Central Stations. 1924—799. Grounding the Neutral. 1925—191. Rates and Contracts. 1916—28.

Simon, A. H., Ph.D., On the Mathematical Theory of the Cottrell Electric Precipitator. 1928-29—535.

Skinkle, W. B., Trend of Recent Boiler Installations in Steel Works. 1927— 1. Discussion of the Elements Entering into the Cost of Producing Power. 1928-29—220.

Skinner, C. E., Relative Efficiency of Insulation of 220 and 440 Volt Apparatus. 1907 Paper 17. Effect of Temperature on the Insulation of Dynamo-Electric Machinery. 1912—287. Steel Mill Electrical Machinery and the Insulation Problem. 1924—101.

Skinner, Merrill, and F. D. Mahoney, The Steel Industry and the Electric Utilities. 1924—651.

Slepian, J., Natural Electricity and Lightning Protection. 1926—32.

Slocum, G. Frank, Points in the Favor of the A.B. and Opposed to Other Makes of Flame Lamps. 1910—28.

Smalley, Mill Type Motors A.C. and D.C., with Controllers. 1908 Paper 12.

Smith, Carl J., Boiler Troubles from the Operating Man's Standpoint. 1923—343. Pressure Regulators at the Inland Steel Co. 1925—305.

Smith, C. J., Methods of Acceleration of Direct Current Mill Auxiliary Motors. 1926—18.

Smith, George W., R. E. Hall, and Carl Fischer, The Prevention of Scale Formation by Boiler Water Conditioning. 1924—353.

Smith, Morgan B., Factors Governing the Purchase of Coal. 1928-29—172.

Smith, L. M., The Operation of Frequency Changers. 1922—773.

Smoot, C. H., Combustion Control by Machinery. 1925—143.

Snyder, W. T., Crane Track Wheels. 1911—72. Tubular Poles for Line Construction. 1912—322. Objects and Scope of the A. I. & S. E. E. 1916—469. Review of the Safety Work of the A. I. & S. E. E. 1916—501. Standardized Motors for the Steel Industry. 1918—99. Remote Controlled Sub-Stations. 1918—479. Standardization Committee Report. 1920—539. Standardization 1917—103.

Snyder, F. A., and R. H. Wright, 10" Strip Mill of the American Steel & Wire Company. 1929-30—128.

Soderberg, A. W., Apprenticeship and Educational Work in the Iron and Steel Industry. 1915—371.

Soule, H. C., Transformers for Steel Mill Service. 1911—46.

Southgate, George T., The Combustion Flame Electrode. 1923—87.

Spackman, G. D., Improvements in Steam Practice as Accomplished at Lukens Steel Company. 1923—703.

Spain, Batt L., Centrifugal Compressors. 1927—363.

Specht, H. C., Winding of Electric Machines. 1912—269.

Spencer, Millard C., Some Recent Developments in Induction Motor Starting. 1921—277.

Spitzglass, J. M., Measurement of Input and Output in Boiler Rooms. 1924—317. Flow Measurement in Connection with Coke Oven Gas. 1929-30—381.

Sprague, J. M., New Blast Furnace Power Plant, Fairfield Works, Tennessee Coal Iron and Railroad Company. 1928-29—721.

Staley, K. A., A. I. & S. E. E. Junior Division, Gloom and Glare vs. Illumination. 1928-29—359. Steel Mill Lighting. 1928-29—729.

Standing, A. J., Steel Mill Electrical Repair Shop Practice 1920—109. Some Steel Mill Crane Problems. 1923—33. Replacement of Obsolete Equipment. 1927—133. The Iron and Steel Engineer. 1928—1. Our Convention and Exposition. 1928-29—143. The Electrical Engineer in the Steel Industry Today. 1926—XII.

Stansel, N. R., Electric Furnaces in Manufacturing. 1926—311.

Steinmetz, Charles P., Protection and Control of Industrial Electric Power. 1915—15. Modern Trend of Power Development. 1922—357. Improvement in Efficiency of Electric Power Supply. 1922—641.

Stephens, C. E., Mill and Metallic Arc Lamps. 1907 Paper 16.

Stevens, F. W., Electric Drilling and Reaming. 1908 Paper 2.

Stevens, R. H., New Rolling Mills; Gautier Plant, Cambria Works, Bethlehem Steel Co., Johnstown, Pa. 1926—281.

Stickney, G. H., Illumination for Iron and Steel Mills. 1910—37. High Candle-Power Mazda Lamps for Steel Mill Lighting. 1914—649.

Stoeckel, A. P., The Induction Drive. 1908 Paper 4.

Stoltz, G. E., Repair and Depreciation of Electrical Apparatus. 1915—341. Recent Electrical Applications in the Steel Mill Industry. 1917—135. Flywheels for Rolling Mill Applications. 1917—721. Electrically Driven Plate Mills. 1918—575. Review of Cost of Rolling Steel in Various Mills. 1921—105. Improved Rolling Mill Practice Obtained by the Use of Direct Current Motors for Main Roll Drive. 1922—849. Electrification as a Means of Reducing Costs. 1928-29—149. Some Methods of Best Utilizing Electrification in the Steel Industry. 1928-29—651.

Stoltz, G. E., and Wilfred Sykes, The Control of Induction Motors for Rolling Mill Drives. 1914—357.

Stone, E. C., and G. M. Gadsby, Central Station Power Rates. 1919—223.

Stone, E. C., Power Systems and the Steel Industry. 1922—279.

Stratton, H. F., Combination Manual and Magnetic Switch Controllers. 1908 Paper 9. Magnetic Control Characteristics. 1914—211. The Operation of Mechanically-Connected Direct Current Motors Permanently in Series or Permanently in Parallel. 1916—655. An Automatic Starter for Induction Motors. 1917—197.

Street, F. D., High Pressure Lubrication. 1928-29—330.

Stripe, Carl, Review of Certain Developments in Fuel Burning and Steam Generation During 1928. 1928-29—461.

Sturtevant, Charles R., Underground Cables. 1912—307.

Sturtevant, J. T., Electrically Driven Mills. 1918—429.

Suckoff, Samuel, Automatic Telephones in the Steel Industry. 1915—419.

Sullivan, John, The Bessemer Process of Making Steel 1921—91.

Suppler, W. C., Electrical Department Organization in a Steel Mill and its Duties. 1919—203.

Swann, Theodore, Manufacture of Phosphoric Acid. 1922—361.

Sweetser, R. H., and S. P. Kinney, Modern Blast Furnace Theory and Practice. 1929-30—100.

Swindler, Charles M., Safe Crane Operators Physical and Mental Requirements. 1926—245.

Sykes, Wilfred, Liquid Rheostats for Industrial Purposes. 1910—30. Power Problems in Steel Mills. 1912—79. Notes on the Present Status of Electric Furnaces. 1913—283. Economics of Electric Drive in Steel Mills. 1914—597. Electrically Driven Reversing Mills. 1914—667.

Sykes, Wilfred, and G. E. Stoltz, Control of Induction Motors for Rolling Mill Drive. 1914—357.

Sykes, Wilfred, and Brent Wiley, The Electrification of Steel Mills and the Use of Central Station Power. 1915—177.

Sykes, Wilfred, and B. G. Lamme, A Review of Steel Mill Electrification. 1922—546.

T

Talley, R. E., Electric Heat in the Iron and Steel Industry. 1926—14.

Tanzer, E. D., Requirements of Lightning Arresters and Factors Effecting their Performance. 1926—29.

Tate, Thos. R., Application of Waste Heat Boilers to Open Hearth Furnaces. 1920—641.

Tegge, A. R., Furnace Bindings. 1928-29—581.

Thompson, C. M., Jr., Electricity a Factor in Reduced Rolling Costs. 1929-30—112.

Tice, H. W., Machine Tool Drives: Motors and Controllers. 1919—1.

Toerring, C. J., Flaming Arc Lamps; Their Operation and Demonstration. 1909 Paper 12.

Torchio, Philip H., Practical Installation of Underground Cables. 1923—269.

Towne, H. M., Protection Against Overvoltage in the Iron and Steel Industry. 1923—49. Lightning Arrester Design and Research. 1926—301.

Townsend, F. P., Recent Developments in Automatic Control. 1917-77.

Treat, R. B., Type W Motors for Mill Service. 1907 Paper 9. Low Speed Motors vs. Motors in Series. 1909 Paper 10. Direct Current Motor Field Coils. 1912—125. Grounded Neutral. 1920—187.

Trexler, E. W., Continuous Bloom and Billet Heating Furnaces. 1926—190.

Trinks, W., The Unaflow Engine. 1916—139. The Mesta Flexible Coupling. 1923—210.

Trumpler, W. E., Flexible Couplings. 1923—219.

Tschentscher, R., Statistical Data of Electrical Applications in the Iron and Steel Industry in the United States. 1914—83.

Tynes, T. E., Lubrication and Methods of Lubricating Cranes. 1911—68. Storeroom and Spares. 384. General Specifications for A.C. Motors for Main Roll Drive. 1919—569. Application of Central Station Power to Steel Mills. 1916—41.

U

Uhl, H. C., Electrical Drives for Rolling Mills. 1925—182. The Super-Synchronous Motor. 1925—196. Speed Regulating Induction Motor Synchronous Generator Frequency Changer Equipments. 1926—83. The Cold Rolling of Strip Steel. 1928-29—106.

Umansky, L. A., Adjustable Speed Drives for Rolling Mills. 1924—817. Selection of Electric Drives for Reversing Mills. 1925—327. Speed Regulation of the Main Roll Drives. 1927—103. Selecting Electrical Equipment. 1928-29—633.

Unland, H. L., Electric Arc Welding. 1918—239. Arc Welding Equipment for Steel Mills and Foundries. 1919—606.

Upp, Edwin L., Electrical Distributing System and Equipment of the National Tube Company, Gary, Ind. 1928-29—55.

V

Van Blarcom, Howell, Steam Turbines. 1907 Paper 15.

Van Brunt, John, Generation of Steam from Coke Breeze. 1925—131. Extending the Heat Cycle in Boiler Rooms by the use of Preheated Air for Combustion Purposes. 1925—416.

Van Campen, J. H., Radical Improvements on Rolling Mills. 1927—137. Anti-Friction Bearings for Roll Necks. 1928-29—250. Characteristics of Cold Rolling Mill Machinery. 1928-29—273.

Vanderwaart, P. T., Power Factor Correction and its Relation to Plant Operation. 1921—213. Safety Switches. 1922—873. Systematizing the Work of an Electrical Engineering Division. 1923—553. Installation and Operation of Static Condensers. 1923—739.

Vincent, H. B., Power Transmission. 1919—135. Protection of High Tension Insulators from Flashovers. 1928-29—311.

Vinet, Eugene, High Tension Practices in Modern Plants. 1928-29—245.

Voss, J. A., Good Order as an Essential for Safety. 1926—242. Safety Stimulates Industrial Friendship. 1928-29—469. Should Colleges and Universities Create a Safety Engineering Course. 1929-30—446.

Vroom, R. C., The Combustion of Liquid Fuel. 1928-29—640.

W

Wachtler, U. B., Mounting and Maintenance of Roller Bearings in Electric Motors. 1924—207.

Walden, A. E., A Recuperator Unit for Industrial Furnaces Burning Oil. 1928-29—281.

Walsh, W. W., Electrolysis and Modern Cable Construction. 1919—97.

Waldorf, Fred., Application of Tapered Roller Bearings on Roll Necks of Rolling Mills and Pinion Stands. 1927—178. Tapered Roller Bearings and Their Application to Steel Mill Equipment. 1929-30—247.

Wales, S. S., The Annual Convention and Power Show. 1925, VII. New Production. 1926, XII. Indirect Effects of Steel Mill Electrification. 1927—132. The Public Service Corporation from the Larger User's Standpoint. 1927—490. Report Committee on Electric Welding. 1928-29—690. Correction Electric Welding Report. 1928-29—736.

Walker, Roy M., and C. C. Eagle, Recording and Controlling Instruments in the Iron and Steel Industry. 1928-29—205.

Walz, G. J., Foot Control. 1923—46. The Evolution of the Application of Electricity to the Manufacture of Steel. 1928-29—151.

Warner, W. L., Electric Arc Welding in the Steel Industry. 1925—1.

Warren, Frank, Electric Welding Machines. 1912—140.

Warren, W. H., Engineering in the Steel Industry. 1928-29—604.

Washburn, F. M., and George E. Rose, The Use of Mixed Gas (Blast Furnace and Coke Oven Gas) on Open Hearth Furnaces at Wisconsin Steel Works. 1929-30—574.

Waters, G. A., Power Transformer Construction for Steel Mills. 1914—391.

Watson, F. C., Electrification of the International Nickel Company's Works for Monel Metal. 1922—415. Electrically Heated Hot Top Ingots. 1926—1.

Watson, C. G., Arc Welded Structural Steel Buildings. 1927—53.

Watson, L. A., C. H. Rippl and W. H. Williams, The Invisible Relay in Vari-Time Control. 1928-29—270.

Watts, H. S., Fuel Gases and their Uses in Iron and Steel Plants. 1922—97. Possibilities in Stage Heating and Steam Extraction in Steel Mill Power Plants. 1923—105.

Wehr, J., 10 Ton Overhead Travelling Crane. 1927—483.

Weischel, H., The Motor that Corrects Power Factor. 1924—43.

Whitcomb, George D., Material Handling Using Gasoline Locomotives. 1928-29—593.

Whiting, M. A., Motor Control. 1910—42. New Development in Control Apparatus for Steel Mills. 1911—13. Control Characteristics of Direct Current and Induction Motors. 1913-37.

Wile, R. S., The Melting of Alloys in the Electric Furnace. 1915—393.

Wiley, Brent, Electrical Equipment in Rolling Mills. 1908 Paper 7. Recent Developments of Motors for Steel Mill Service. 1911—82. Present Status of Motor Drive for Main Rolls of Steel Mills. 1913—171. Factors Relating to the Economical Generation and Use of Electric Power in the Steel Industry. 1917—311. Statistical Data. 1916—40.

Wiley, Brent, and Wilfred Sykes, The Electrification of Steel Mills and the Use of Central Station Power. 1915—177.

Wiley, F. A., and C. M. Brading, Safety Movement in Steel Mills. 1919—255. Safety Organization, General Safety Rules. 1922—682.
Wiley, F. A., 40" Reversing Blooming Mill, Wisconsin Steel Company. 1928-29—58.
Williams, W. H., Developments in Control. 1929-30—398.
Williams, W. H., L. A. Watson and C. H. Rippl, The Invisible Relay in Vari-Time Control. 1928-29—270.
Williamson, G., Selection of Carbon Brushes. 1928-29—511.
Wilson, J. C., Measuring Gas Electrically. 1918—115.
Wilson, G. P., Frequency Converter Speed Sets for the Carnegie Steel Co., Upper Union Works, Youngstown, Ohio. 1927—487.
Winder, C. A., Electric Heat Treatment. 1919—507.
Winne, H. A., The Application of Direct Current Motors to Main Roll Drives. 1927—95. The Application of Synchronous Motors in Steel Mills. 1927—152.
Winslow, G. H., Report of Operation of Stoeckel Induction Drive. 1908 Paper 1.
Winters, E. P., Direct Current in By-Product Plants. 1921—257.
Witting, A. G., Judging the Combustion of Gaseous Fuels from Gas Analysis. 1922—499. Value of Luminosity in Gas. 1928-29—694.
Wohlgemuth, M. J., and E. K. Read, Selection and Maintenance of Oil Circuit Breakers. 1925—288.
Wolcott, Robert W., Companionate Prosperity. 1928-29—454.
Wood, A. R., Lightning Arrester Protection on 13,200 V. and 2,400 V. Distribution Lines. 1926—25.
Woodhull, F. H., The Regulating Storage Battery as Applied to Steel Works. 1911—130. Automatic Electrolytic —Oxy-Hydrogen Plant. 1919—217. Electric Cranes. 1923—41.
Worker, Joseph G., Fuel Economy by Co-operating in Establishing a Better Practice in the Operation of Stokers and Boilers. 1917—465. Extending the Heat Cycle in Boiler Rooms by the Use of Preheated Air for Combustion Purposes. 1925—274.
Wright, D. C., Safety Limit Stops for Hoists. 1929-30—349. Time Current Control Direct Current Motors. 1929-30—3. Recent Developments in Dynamic Braking Lowering. 1929-30—263.
Wright, J. D., Speed Control of Induction Motors for Steel Mill Drive. 1916—693. Auxiliary Motors for Steel Mills. 1918—599. Electric Mill Drives. 1920—1. Control Equipments for Auxiliary Motors. 1921—615. Some Electrical Developments. 1924—58. Electrically Driven Reversing Mills. 1924—417. Atomic Hydrogen Arc Welding. 1928-29—47. 1928 Developments in Steel Mill Drives. 1928-29—465. Application of Electric Drives to Rolling Mills. 1929-30—192.
Wright, J. D., R. W. Davis, and O. H. Needham, Electrically Driven Reversing Mills. 1924—513.
Wright, R. H., Modern Reversing Mill Drives. 1929-30—374.
Wright, R. H., and F. A. Snyder, 10" Strip Mill of the American Steel and Wire Company. 1929-30—128.

Y

Yawger, The Leblanc Condenser. 1909 Paper 11.
Yearsley, E. W., The Auxiliary Control and Automatic Acceleration of Electric Motors. 1907 Paper 1. Electric Motor Drive. 1908 Paper 5. The Production of Steel and Iron in the Electric Furnace. 1909 Paper 1.
Young, H. W., New Graphic Record for Steel Mill Service. 1910—63.

LIST OF SUBJECTS

A

Abatement in Industry—Smoke—By M. J. Conway. 1929-30—114.
A. B. Lamp as Opposed to Other Makes of Flame Lamps —Points in Favor of the—By G. Frank Slocum. 1910—28.
Acceleration of Direct Current Mill Auxiliary Motors—Methods of—By C. J. Smith. 1926—16.
Acceleration of Electric Motors—The Auxiliary Control and Automatic—By E. W. Yearsley. 1907—Paper 1.
Accessories—Underground Cables and—By J. C. Bowman. 1914—317.
Accident Experience in the Iron and Steel Industry. 1928-29—8.
Accident Hazard—Standardization of Electrical Equipment and Its Relation to—By W. Greenwood. 1920—297.
Accident—One Hundred Days Without an—By R. F. Gale. 1928-29—597.
Accident Prevention—By W. Greenwood. 1925—46.
Accident Prevention—General Safety Movement and—By A. I. & S. E. E. Safety Committee, H. A. Schultz, Chairman. 1917—45.
Accident Prevention, Joliet Works, Illinois Steel Co.—By John Eib. 1928-29—65.
Accomplished at Lukens Steel Company—Improvements in Steam Practice as—By G. D. Spackman, 1925, 703.
Accomplishments and Possibilities of the Oxy-Acetylene Process—The—By M. S. Pumley. 1912—151.
Accounting—Power—By W. O. Oschmann. 1917—163.
Accumulator Pumps—Motor Driven—By J. R. Penman. 1923—44.
Acid—Manufacture of Phosphoric—By Theodore Swann. 1922—361.
Activities of A. I. & S. E. E.—By G. H. Schaeffer. 1926—IX.
Additions to Rolling Mills at Steubenville Plant of the Wheeling Steel Corp.—By M. J. Conway. 1926—114.
Adhesive Impingement Method—Cleaning Air by the—By J. H. Milliken. 1929-30—55.
Adjustable Speed Direct Current Motors—Alternating Current Phase Wound Motors—vs.—By D. M. Petty. 1916—719.
Adjustable Speed Drives—Direct Current. 1929-30—239.
Adjustable Speed Drives for Rolling Mills—By L. A. Umansky. 1924—817.
Adjustable Speed Main Roll Drives—By M. H. Morgan. 1928-29—362.
Adjustable Speed Motor Drives—By R. W. Davis. 1923—645.
Advances in Industrial Lighting—Some Recent—By Ward Harrison. 1917—635.
Advantages—Controls and Their—By A. C. Eastwood. 1909—Paper 5.
Advantages of Central Station Power Over Steel Plant Generation—By D. B. Rushmore. 1916—21.
Advantages of Electric Heat Treatment—The Tangible—By Wirt S. Scott. 1929-30—289.
Advantages of Modern Types of Direct Current Machines—By David Hall. 1916—83.
Advantages of Motor Generator Sets and Rotary Converters for D.C. Systems—By P. Lincoln. 1907—Paper 14.
Adventures in Lubrication—By H. M. Ludwick. 1927—419.
Affecting the Application of Carbon Brushes to Direct Current Machines—Factors—By C. W. Lange. 1928-29—509.
A. I. & S. E. E.—Activities of—By G. H. Schaeffer. 1926—IX.
A. I. & S. E. E. and Pennsylvania State College Electric Heating Conference—1929-30—281.
A. I. & S. E. E. and Safety—Walter Greenwood. 1928-29—16.
A. I. & S. E. E.—Apprentice Systems—By Educational Committee, C. A. Menk, Chairman. 1916—615.
A. I. & S. E. E.—Combustion Section—By W. P. Chandler, Jr. 1925—VIII.
A. I. & S. E. E.—Educational Committee for 1921, Crane Operators Manual—Report of—By L. F. Galbraith, Chairman. 1921—509.
A. I. & S. E. E., Educational Committee, Methods of Education for Electrical Employees of Iron and Steel Mills. 1918—303.
A. I. & S. E. E., Electric Heat Committee Report—By G. H. Schaeffer, Chairman. 1927—187.
A. I. & S. E. E., Electric Overhead Traveling Crane Specifications. 1929-30—520.
A. I. & S. E. E., Electrical Developments Committee Report for 1922—By R. B. Gerhardt, Chairman. 1922—605.
A. I. & S. E. E., Electrical Developments Committee Yearly Report—By W. H. Burr, Chairman. 1928-29—153.

A. I. & S. E. E. for 1917—Report of Standardization Committee of—By W. T. Snyder, Chairman. 1917—533.
A. I. & S. E. E.—Growth of—The—By R. S. Shoemaker. 1926—X.
A. I. & S. E. E. in Connection with the Development of Anti-Friction Bearings in the Iron and Steel Industry—A Review of the Proceedings of. 1929-30—181.
A. I. & S. E. E., Junior Division, Direct Current Magnetic Controllers. 1928-29—284.
A. I. & S. E. E., Junior Division, Direct Current Motor Control, 1928-29, 138.
A. I. & S. E. E., Junior Division, Elements of Commutation—By Jerry Albrecht. 1928-29—494.
A. I. & S. E. E., Junior Division, Factory Testing of Electrical Apparatus. 1928-29—446.
A. I. & S. E. E., Junior Division, Gloom and Glare vs. Illumination—By K. A. Staley. 1928-29—359.
A. I. & S. E. E., Junior Division, Regulation of Alternating Current Generators. 1929-30—163.
A. I. & S. E. E., Junior Division, Standard Testing Direct Current Motors and Generators. 1928-29—413.
A. I. & S. E. E., Junior Division, Steel Mill Lighting—By K. A. Staley. 1928-29—729.
A. I. & S. E. E.—Objects and Scope of the—By W. T. Snyder. 1916—469.
A. I. & S. E. E.—Recommendations Covering Rules for the Safe Operation of Electric Overhead Traveling Cranes. 1926—89.
A. I. & S. E. E.—Report of Committee on Electric Heat, By G. H. Schaeffer, Ch., 1925, 228.
A. I. & S. E. E.—Report of Control Committee for 1922, By F. W. Cramer, 1922, 621.
A. I. & S. E. E.—Report of Educational Committee—By A. B. Holcomb, Chairman. 1919—327.
A. I. & S. E. E.—Report of Electric Furnace Committee for 1924, By G. H. Schaeffer, Ch., 1924, 731.
A. I. & S. E. E.—Report of Electric Heat Committee—1928-29—By G. H. Schaeffer, Chairman. 1929-30—67.
A. I. & S. E. E.—Report of Electric Heat Committee for 1926—By W. P. Chandler, Jr., Chairman. 1926—99.
A. I. & S. E. E.—Report of Electric Welding Committee, By S. S. Wales, Chairman, 1928-29, 690.
A. I. & S. E. E.—Report of Electrical Developments Committee—By W. H. Burr, Chairman. 1927—203.
A. I. & S. E. E.—Report of Electrical Developments Committee for 1923—By W. C. Kennedy, Chairman. 1923—523.
A. I. & S. E. E.—Report of Electrical Development Committee for 1928-29—By W. H. Burr. 1928-29—605.
A. I. & S. E. E.—Report of Electrical Developments Committee—Year 1929-30—By W. H. Burr, Chairman. 1929-30—451.
A. I. & S. E. E.—Report of Gas Utilization Committee—By W. N. Flanagan. 1928-29—693.
A. I. & S. E. E.—Report of Special Bearings Committee for 1923—By D. M. Petty, Chairman. 1923—499.
A. I. & S. E. E.—Report of the Committee on Electric Heat—By G. H. Schaeffer, Chairman. 1928-29—233.
A. I. & S. E. E.—Report of the Special Committee on Bearings—1928-29—By F. D. Egan. 1928-29—656.
A. I. & S. E. E.—Report of Standardization Committee, 1918—By W. T. Snyder, Ch. 1918—495.
A. I. & S. E. E.—Report of Standardization Sub-Committee on Motors, By D. M. Petty, Ch., 1922, 673.
A. I. & S. E. E.—Report of Sub-Committee on Illumination—By R. G. Bauer. 1922—662.
A. I. & S. E. E.—Safety Committee—Rules for Safe Operation of Electric Cranes. 1918—273.
A. I. & S. E. E.—Safety Committee, Walter Greenwood, Chairman—Safety Rules for Government of Employees Working on Electrical Equipment. 1919—315.
A. I. & S. E. E.—Safety Committee, General Safety Movement and Accident Prevention, By H. A. Schultz, Ch., 1917, 45.
A. I. & S. E. E.—Safety Committee—Safety Organization—General Safety Rules—By F. A. Wiley, Chairman. 1922—682.
A. I. & S. E. E.—Special Bearings Committee—Introduction Ball and Roller Bearings—By D. M. Petty, Chairman. 1924—131.
A. I. & S. E. E. Special Committee on Bearings, 1929-30—Report of the—By F. D. Egan, Chairman. 1929-30—460.
A. I. & S. E. E.—Special Committee on Bearings, Special Study Regarding Lubrication of Anti-Friction Bearings on Mill and Crane Motors—By F. D. Egan, Chairman. 1928-29—701.
A. I. & S. E. E.—W. T. Snyder, Chairman, Standardization—By Standardization Committee. 1916—567.
A. I. & S. E. E.—Standardization Committee, A. C. Cummins, Chairman—Standardized Commutating Pole Mill Type Motor. 1926—262.
A. I. & S. E. E.—Report of Standardization Sub-Committee on Transmission, By A. R. Leavitt, Ch., 1922, 665.
A. I. & S. E. E.—Standardization Committee—Final Outline Dimensions for Mill Type Motor. 1928-29—247.
A. I. & S. E. E.—Standardization Committee—General Specification for Alternating Current Motors for Main Roll Drive—By T. E. Tynes, Ch., 1919, 56.
A. I. & S. E. E.—Steel Mill Auxiliary Control Specification Guide Forms. 1929-30—170.
Aid to Crane Maintenance—Organized Inspection as an—By T. J. Flaherty. 1929-30—448.
Air By the Adhesive Impingement Method—Cleaning—By J. H. Milliken. 1929-30—55.
Air Compressor Plants for Avoidance of Explosions—Installation and Operation of—By W. Greenwood. 1927—126.
Air Conditioning Equipment—By W. H. Burr. 1928-29—275.
Air for Blowing a Gas Producer—The Application of Blast Furnace Gas and—By G. R. McDermott. 1925—126.
Air for Combustion Purposes—Extending the Heat Cycle in Boiler Rooms by the Use of Preheated—By J. G. Worker. 1925—274.
Air Heater—Metal for Industrial Furnaces—By Waldemar Dyrssen. 1928-29—23.
Air Preheater—The Ljungstrom—By B. G. Brolinson. 1924—461.
Aliquippa Plant of the Jones & Laughlin Steel Corp.—Electrical Installations at the—By R. M. Hussey. 1927—448.
Allen Bradley Controllers and Starters—By Lynde Bradley. 1909—Paper 6.
Alliance Machine Company—Latest Development of Electric Cranes for Steel Mills Manufactured by the—By E. H. Kendall. 1915—281.
Alloys and Their Use in the Steel Plant—Heat Resisting—By J. D. Corfield. 1928-29—549.
Alloys in the Electric Furnace—The Melting of—By R. S. Wile. 1915—393.
Alloy Steels—Electric Melting of—By H. M. German. 1928-29—435.
Alternating Current and Direct Current Magnetic Control for Auxiliary Motors—By W. O. Lum. 1914—239.
Alternating Current and Direct Current with Controllers—Mill Type Motors—By D. F. Smalley. 1908—Paper 12.
Alternating Current Arc Welder—By R. M. Rush. 1919—623.
Alternating Current Equipment—Effect of Transient Phenomena on the Design and Selection of—By E. G. Merrick. 1928-29—263.
Alternating Current Generators and Induction Motors—By E. Heitman. 1907—Paper 8.
Alternating Current Generators—Regulation of—A. I. & S. E. E., Junior Division. 1929-30—163.
Alternating Current in By-Product Plants—By W. V. Dunn. 1921—249.
Alternating Current Motors as Applied to Cranes—Control of Direct Current and—By Paul Caldwell. 1916—229.
Alternating Current Motors for Main Roll Drives—General Specifications for—By Standardization Committee, T. E. Tynes, Chairman. 1919—569.
Alternating Current Motors for Main Roll Drives—General Specifications of—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Chairman. 1921—479.
Alternating Current Motors with Dynamic Braking and Regenerative Braking—Grab Bucket Coal Hoists Operated by—By James Farrington and R. H. McClain. 1917—439.
Alternating Current Phase Wound Motors vs. Adjustable Speed Direct Current Motors—By D. M. Petty. 1916—719.
Alternating Current Speed Sets. 1929-30—238.
Alternating Current to Direct Current—The Conversion of—By G. H. Finks. 1924—1.

Alternating Current Two-Speed Mill Controller—Full Reverse—By E. G. Peterson, 1926, 308.
Alternating Current vs. Direct Current Motors for Rolling Mill Table Drives—By W. S. Hall. 1919—419.
Alternating Systems in Steel Mills—First Cost and Operating Expenses of Mixed vs. Exclusively—By Gano Dunn. 1910—65.
Alternating vs. Direct Current Motors for Steel Mill Auxiliaries—Cost and Efficiency of—By B. R. Shover and Edward J. Cheney. 1911—90.
Aluminum, Copper, Brass and Non-Ferrous Mill Drives. 1929-30—229.
Aluminum Steel Lightning Arresters—New—By D. B. Rushmore. 1908—Paper 11.
Ampere-Hour Meters and Their Applications in Steel Mills—Watthour and—By R. C. Lanphier. 1914—419.
American Iron and Steel Industry—The Economic and Social Development of the—By T. W. Robinson. 1927—477.
American Steel and Wire Company, Worcester, Mass.—Rod Mill Electrification at the South Works of the—By Roger H. Bryant. 1928-29—429.
American Steel and Wire Company, 10" Strip Mill—By F. A. Snyder and R. H. Wright. 1929-30—128.
Analysis—Judging the Combustion of Gaseous Fuels from Gas—By A. G. Witting. 1922—499.
Analysis of the Motor Bearing Problem—An—By F. W. Cramer. 1927—227.
Analysis of 40-Inch Blooming Mill Screwdown—Mechanical and Electrical—By F. D. Egan. 1924—487.
Analysis—Rolling Mill—By E. Kieft. 1929-30—438.
Annealing and Heat Treating Furnaces—Electric—By G. P. Mills. 1921—1.
Annealing Furnace—Experiences with Electrical Bright—By A. Pomp. 1927—377.
Annealing Furnace—Tests with an Electrical Bright—By E. Schreiber. 1927—379.
Annealing Furnace—The Electric—By James Kniveton. 1929-30—305.
Annealing Treatment and Forging of Steel—The Electric Furnace for—By Wirt S. Scott. 1918—193.
Annual Convention and Iron and Steel Exposition—Twenty-Sixth—By F. W. Cramer, 1929-30, 403.
Annual Convention and Power Show—The—By S. S. Wales. 1925—VII.
Annual Convention—Our Twentieth—By R. S. Shoemaker, 1925, VI.
Anti-Friction Bearings—Application of—By H. E. Brunner. 1924—179.
Anti-Friction Bearings—Application of—By F. W. Gurney. 1924—147.
Anti-Friction Bearings for Auxiliaries in the Iron and Steel Industry—By E. S. Jefferies. 1928-29—184.
Anti-Friction Bearings for Electric Motors—By J. S. Murray. 1928-29—185.
Anti-Friction Bearings for Roll Necks—By J. H. Van Campen. 1928-29—250.
Anti-Friction Bearings for Use on Roll and Pinion Necks—A. I. & S. E. E. Questionnaire. 1928-29—80.
Anti-Friction Bearings in the Iron and Steel Industry—A Review of the Proceedings of the A. I. & S. E. E. in Connection with the Development of. 1929-30—181.
Anti-Friction Bearings in the Steel Mill—By A. M. MacCutcheon. 1921—429.
Anti-Friction Bearings on Mill and Crane Motors—Special Study Regarding Lubrication of—A. I. & S. E. E. Special Committee on Bearings—By F. D. Egan, Chairman. 1928-29—701.
Anti-Friction Bearings on Roll Necks of Rolling Mills—By E. C. Gainsborg. 1927—184.
Anti-Friction Bearings—Selection, Installation and Operation of—By J. R. T. Bell. 1924—193.
Anti-Friction Bearings to Roll Necks of Steel Mills—Application of—By E. C. Gainsborg. 1927—36.
Anti-Friction Bearings to Roll and Pinion Necks—Application of—By D. M. Petty. 1928-29—288.
Anti-Friction Bearings to Steel Mill Machinery—Application of—By G. R. Holmes. 1926—16.
Apparatus and Appliances—Latest Developments in New—By Electrical Developments Committee, A. I. & S. E. E., W. T. Snyder, Chairman. 1916—533.
Apparatus at Gary—New Resistance Grid Interlocking Systems—Controlling—By C. T. Henderson. 1908—Paper 8.
Apparatus Built by the General Electric Company for Mill Service—By D. B. Rushmore. 1907—Paper 3.
Apparatus—Consideration of Safety in the Design of Standard—By C. V. Pirtle. 1910—22.
Apparatus—Factory Testing of Electrical—A. I. & S. E. E., Junior Division. 1928-29—446.
Apparatus for Cranes and Machine Tools—Standardization of Electrical—By H. Cosden. 1917—663.
Apparatus for Steel Mills—New Developments in Control—By M. A. Whiting. 1911—13.
Apparatus in Iron and Steel Mills—Application of Auxiliary—By S. C. Coey. 1914—183.
Apparatus in Steel Mills—Control of Motor Driven Auxiliary—By H. D. James. 1908—Paper 5.
Apparatus—Inspection and Operation of Electrical—By J. A. Morgan and J. J. Booth. 1919—369.
Apparatus—New Developments in Electric—By K. A. Pauly. 1909—Paper 7.
Apparatus—Recent Developments in Power Generating—By P. M. Lincoln. 1915—45.
Apparatus—Relative Efficiency of Insulation of 220 and 440 Volt—By C. E. Skinner. 1907—Paper 17.
Apparatus—Repair and Depreciation of Electrical—By G. E. Stoltz. 1915—341.
Apparatus—Some Practical and Theoretical Considerations In the Design of Electrical Arc Welding—By Robert E. Kinkead. 1919—614.
Appliances—Latest Developments in New Apparatus and—By Electrical Developments Committee, A. I. & S. E. E., W. T. Snyder, Chairman. 1916—533.
Applicability to Steel Mill Equipment—Tapered Roller Bearings and Their—By F. Waldorf. 1929-30—247.
Applications and Maintenance—Ball Bearing—By H. R. Reynolds. 1924—167.
Application in the Iron and Steel Industry in the United States—Statistical Data of Electrical—By R. Tschentscher. 1914—83.
Application of Anti-Friction Bearings—By H. E. Brunner. 1924—179.
Application of Anti-Friction Bearings—By F. W. Gurney. 1924—147.
Application of Anti-Friction Bearings to Roll and Pinion Necks—By D. M. Petty. 1928-29—288.
Application of Anti-Friction Bearings to Roll Necks of Steel Mills—By E. C. Gainsborg. 1927—36.
Application of Anti-Friction Bearings to Steel Mill Machinery—By G. R. Holmes. 1926—16.
Application of Auxiliary Apparatus in Iron and Steel Mills—By S. C. Coey. 1914—183.
Application of Ball Bearings—Design and—By T. D. Crow. 1924—233.
Application of Blast Furnace Gas and Air for Blowing a Gas Producer—The—By G. R. McDermott. 1925—126.
Application of Carbon Brushes to Direct Current Machines Factors Affecting the—By C. W. Lange. 1928-29—509.
Application of Central Station Power to Steel Mills, By T. E. Tynes, 1916, 41.
Application of Direct Current Brushes—Selection and—By R. H. Newton. 1928-29—531.
Application of Direct Current Motors to Main Roll Drives—By H. A. Winne. 1927—95.
Application of Electric Drives to Rolling Mills in 1929—By J. D. Wright. 1929-30—192.
Application of Electric Power in the Iron and Steel Industry—The—By W. S. Hall. 1922—127.
Application of Electricity to the Manufacture of Steel—Evolution of the—By George J. Walz. 1928-29—151.
Application of High Duty Worm Gears in Steel Plants—By A. L. Henthorn. 1926—75.
Application of Large Motors to Reversing and Non-Reversing Rolling Mills—By K. A. Pauly. 1907—Paper 4.
Application of Pulverized Coal to Industrial Furnaces—By W. A. Shoudy. 1928-29—123.
Application of Pulverized Coal to Metallurgical Furnaces—By W. O. Renkin. 1929-30—19.
Application of Roller Bearings to General Electric Co. MD Motors—By C. W. Lange. 1928-29—664.
Application of Storage Batteries to Iron and Steel Mills—The—By R. C. Hull. 1908—Paper 10.
Application of the Principle of Surface Contact to Industrial Haulage—The—By Charles L. Kinsloe. 1915—441.
Application of Synchronous Motors in Steel Mills—By H. A. Winne. 1927—152.
Application of Synchronous Motors to Continuous Mills—By F. O. Schnure. 1925—86.
Application of Taper Roller Bearings—By T. V. Buckwalter. 1924—133.

Application of Tapered Roller Bearings on Roll Necks of Rolling Mills and Pinion Stands—By Fred Waldorf. 1927—178.
Application of the Automatic Substation to Steel Mill Service—By A. P. Ding. 1928-29—490.
Application of the Corduroy Crane to Industrial Plants—By N. P. Farrar. 1928-29—588.
Application of Waste Heat Boilers to Open Hearth Furnaces—By Thomas R. Tate. 1920—641.
Application—Surface Combustion and Its—By W. M. Hepburn. 1923—537.
Application—The Essential Factor in Furnace Design—Fuel—By E. J. Evans. 1925—123.
Application to Leveling Up Load Curves—Essentials of Design of Electric Industrial Furnaces and Their—By G. P. Mills. 1925—11.
Applications—Electric Heat Treating Furnace—By E. A. Hurme. 1925—229.
Applications—Flywheels for Rolling Mill—By G. E. Stoltz. 1917—721.
Applications in Steel Mill Practice—Some Electrical—By D. M. Petty. 1915—233.
Applications in Steel Mills—Watthour and Ampere-Hour Meters and Their—By R. C. Lanphier. 1914—419.
Applications in the Steel Mill Industry—Recent Electrical—By G. E. Stoltz. 1917—135.
Applications—Medium and Low Temperature Furnace—By E. A. Hurme. 1924—771.
Applications—New and Interesting Auxiliary Motor and Control—By Phelan McShane. 1926—328.
Applications of Oxygen to Ferrous Metallurgy—Some—By F. W. Davis. 1924—427.
Applications—Parallel Operation of Synchronous Converters for Steel Mill—By W. B. Shirk. 1927—356.
Applications—Synchronous Motor—By James F. Burke. 1925—30.
Applications to Iron and Steel—Annual Report of Committee of A. I. E. E. 1928-29—445.
Applications—Topical Discussion—Developments in Ball and Roller Bearing—By Membership, A. I. & S. E. E. 1927—9.
Applied to Blast Furnace Skip Hoists—Ward-Leonard Control as—By E. Anderson. 1928-29—477.
Applied to Cranes—Control of A.C. and D.C. Motors as—By Paul Caldwell. 1916—229.
Applied to Industrial Plants—The Measurement of Electricity as—By H. H. Pratt. 1925—349.
Applied to Mill Motors—Roller Bearings—By L. J. Hess. 1922—811.
Applied to Steel Mills—Automatic and Controlled Sub-Station as—By J. K. Ostrander, 1922, 365.
Applied to Steel Mills—The Apprenticeship System as—By B. W. Gilson. 1914—89.
Applied to Steel Works—The Regulating Storage Battery as—By F. H. Woodhull. 1911—130.
Applied to a Steel Plant Power Transmission System—Short Circuit Study—By R. M. Hussey. 1929-30—31.
Applied to the Iron and Steel Industry—Portable Electric Tools as—By A. M. Andresen. 1916—447.
Applied to the Mechanical Mining of Coal—Electricity—By C. B. Reed. 1919—179.
Applied to the Steel Industry—Electric Heating—By F. A. Hansen. 1922—837.
Applying the Principles of Steel Mill Practice to Arc Welding—By J. B. Austin. 1929-30—499.
Apprentice Systems—By Educational Committee, A. I. & S. E. E., C. A. Menk, Chairman. 1916—615.
Apprenticeship and Educational Work in the Iron and Steel Industry—By A. W. Soderberg. 1915—371.
Apprenticeship System as Applied to Steel Mills—The—By B. W. Gilson. 1914—89.
Arc Cutting and Welding—Electric—By C. J. Holslag. 1919—618.
Arc—Cutting Steel Mill Maintenance Costs with the Welding—By A. M. Candy. 1925—8.
Arc Furnace—Mechanical and Electrical Operation of the Heroult Electric—By G. W. Richardson. 1916—399.
Arc Furnaces Used in the Melting and Refining of Ferrous Metals—Selection of Electrical Equipment—By Samuel Arnold, III. 1928-29—487.
Arc Lamp in the Iron and Steel Industry—The Flaming—By A. T. Baldwin. 1914—491.
Arc Lamps—Excello—By A. Cair. 1910—59.
Arc Lamps—Mill and Metallic—By C. E. Stephens. 1907—Paper 16.
Arc Lamps: Their Operation and Demonstration—Flaming By C. J. Toerring. 1909—Paper 12.
Arc—Rectifiers—with each other, with Rotary Converters and with Motor Generators—The Parallel Operation of Mercury—By O. K. Marti. 1927—353.
Arc System of Welding—The Plastic—By Alexander Churchward. 1919—603.
Arc Welded Structural Steel Buildings—By C. G. Watson. 1927—53.
Arc Welder—Alternating Current—By R. M. Rush. 1919—623.
Arc Welding—By Grover Hughes. 1928-29—467.
Arc Welding—By J. F. Lincoln. 1912—133.
Arc Welding and the New Market for Rolling Mill Shapes—By J. F. Lincoln. 1928-29—81.
Arc Welding Apparatus—Some Practical and Theoretical Considerations in the Design of Electrical—By Robert E. Kinkead. 1919—614.
Arc Welding—Applying the Principles of Steel Mill Practice to—By J. B. Austin. 1929-30—499.
Arc Welding—Atomic Hydrogen—By J. D. Wright. 1928-29—47.
Arc Welding—Direct Current Metal—By F. T. Llewellyn. 1928-29—411.
Arc Welding—Electric—By H. L. Unland. 1918—239.
Arc Welding Equipment for Steel Mills and Foundries—By H. L. Unland. 1919—606.
Arc Welding is Selling Steel—By John Lincoln. 1928-29—290.
Arc Welding in the Iron and Steel Industry—Present Status of—By Membership, 1919, 603.
Arc Welding in the Steel Industry—Electric—By W. L. Warner. 1925—1.
Arc Welding—Modern Structural Industry Demands a Knowledge of—By C. J. Holslag. 1928-29—35.
Arc Welding—Some Recent Developments in—By K. L. Hansen. 1929-30—283.
Arc Welding—Some Recent Investigations in—By O. H. Escholz. 1917—697.
Arc Welding Systems—By A. M. Bennett. 1919—610.
Arc Welding—The Present Status of Electric—By A. M. Candy. 1919—627.
Armature Windings for Multi-Polar Generators and Motors—Frog Leg Windings—Direct Current—By W. H. Powell and G. M. Albrecht. 1925—198.
Arresters and Factors Affecting Their Performance—Requirements of Lightning—By E. D. Tanzer. 1926—29.
Arrester Design and Research—Lightning—By H. M. Towne. 1926—301.
Arresters—Lightning—By C. E. Bennett. 1920—579.
Arresters—New Aluminum Steel Lightning—By D. B. Rushmore. 1908—Paper 11.
Arrester Protection on 13,200 V. and 2,400 V. Distribution Lines—Lightning—By A. R. Wood. 1926—25.
Aspects of the Furnace Manufacturer—Some of the Business—By F. C. Manker. 1929-30—132.
Atomic Hydrogen Arc Welding—By J. D. Wright. 1928-29—47.
Autogenous Welding—Steel Plant Maintenance by—By Walter Petry. 1921—679.
Automatic Acceleration of Electric Motors—The Auxiliary Control and—By E. W. Yearsley. 1907—Paper 1.
Automatic and Remote Controlled Sub-Stations as Applied to Steel Mills—By J. K. Ostrander. 1922—365.
Automatic Blast Furnace—The—By F. W. Cramer. 1925—88.
Automatic Combustion Control—By E. G. Bailey. 1925—150.
Automatic Control of Reversing Rolling Mill Equipment—By E. S. Lammers, Jr. 1920—137.
Automatic Control of Synchronous Motors—The—By J. H. Hall. 1927—427.
Automatic Control—Recent Developments in—By H. P. Townsend. 1917—77.
Automatic Door Hoist for Open Hearth Furnaces—By W. H. Burr and H. A. Lewis. 1918—209.
Automatic Electrolytic-Oxyhydrogen Plant—By F. H. Woodhull, 1919, 217.
Automatic Engine Stops—By W. Greenwood. 1918—325.
Automatic Equipment—Centrifugal Pumps with—By N. C. Bye. 1928-29—279.
Automatic Motor Control—By A. C. Eastwood. 1911—25.
Automatic Speed Regulating Equipment for Induction Motors with Fly Wheels—By E. J. Cheney. 1912—115.

Automatic Starter for Induction Motors—By H. F. Stratton. 1917—197.
Automatic Substation to Steel Mill Service—Application of the—By A. P. Ding. 1928-29—490.
Automatic Telephones in the Steel Industry—By S. Suekoff. 1915—419.
Automatically Opening and Closing Receptacles Containing Inflammable Fluid—By Walter Greenwood. 1928-29—444.
Auxiliary Apparatus in Iron and Steel Mills—Application of—By S. C. Coey. 1914—183.
Auxiliary Apparatus in Steel Mills—Control of Motor Driven—By H. D. James. 1908—Paper 5.
Auxiliary Control and Automatic Acceleration of Electric Motors—The—By E. W. Yearsley. 1907—Paper 1.
Auxiliary Control Specification Guide Forms—Steel Mill—A. I. & S. E. E. 1929-30—170.
Auxiliary Drives—By Gordon Fox. 1919—123.
Auxiliary Drives—Considerations Concerning—By Gordon Fox. 1920—343.
Auxiliary Drives for Steam Electric Generating Stations—Auxiliaries and—By A. L. Penniman, Jr., and F. W. Quarles. 1925—255.
Auxiliary Motor and Control Applications—New and Interesting—By Phelan McShane. 1926—328.
Auxiliary Motors—Alternating Current and Direct Current Magnetic Control for—By W. O. Lum. 1914—239.
Auxiliary Motors—Control Equipments for—By J. D. Wright. 1921—615.
Auxiliary Motors for Steel Mills—By J. D. Wright. 1918—599.
Auxiliary Motors—Methods of Acceleration of Direct Current Mill—By C. J. Smith. 1926—16.
Auxiliary Steel Mill Drives—Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in—By J. E. Fries. 1919—671.
Auxiliaries—Condensers and Their—By R. N. Ehrhart. 1914—543.
Auxiliaries and Auxiliary Drives for Steam Electric Generating Stations—By A. L. Penniman, Jr., and F. W. Quarles. 1925—255.
Auxiliaries—Cost and Efficiency of Alternating vs. Direct Current Motors for Steel Mill—By B. R. Shover and Edward J. Cheney. 1911—90.
Auxiliaries—Drives for Power Plant—By F. T. Leilich. 1927—115.
Auxiliaries—Hydraulic vs. Electric Drive for Steel Mill—By R. B. Gerhardt. 1919—85.
Auxiliaries in the Iron and Steel Industry—Anti-Friction Bearings for—By E. S. Jefferies. 1928-29—184.
Auxiliaries—Magnetic Control for Steel Mill—By H. H. Angel. 1926—229.
Avoidance of Explosions—Installation and Operation of Air Compressor Plants for—By W. Greenwood. 1927—126.
Award for 1927—Jones and Laughlin Safety Trophy. 1928-29—51.

B

Babbitting—Babbitts and—By T. D. Lynch. 1920—161.
Babbitt and Babbitting—By T. D. Lynch. 1920—161.
Backed Up Type Removes Cold Rolling Limitations—Mills of the—By Lloyd Jones. 1927—498.
Ball and Roller Bearing Applications—Topical Discussion—Developments in—By Membership, A. I. & S. E. E. 1927—9.
Ball and Roller Bearings—Introduction—By D. M. Petty, Chairman, Special Bearings Committee, A. I. & S. E. E. 1924—131.
Ball Bearing Applications and Maintenance—By H. R. Reynolds. 1924—167.
Ball Bearings—Design and Application of—By T. D. Crow. 1924—233.
Bar and Billet Mill Drives. 1929-30—231.
Bar and Rod Mills—Selection of Motors for Main Drives of Merchant—By C. B. Huston. 1928-29—160.
Bar and Skelp Mill at Indiana Harbor—New Sheet—By A. E. Beardmore. 1927—238.
Bar and Skelp Mill Drive—Sheet. 1929-30—234.
Basic Open Hearth Construction—Chief Features of—By M. J. Conway. 1929-30—318.
Bath Furnaces for Heat Treating—Electric Salt—By A. E. Bellis. 1929-30—311.
Batteries to Iron and Steel Mills—The Application of Storage—By R. C. Hull. 1908—Paper 10.
Battery as Applied to Steel Works—The Regulating Storage—By F. H. Woodhull. 1911—130.
Bearing Applications and Maintenance—Ball—By H. R. Reynolds. 1924—167.
Bearings—Application of Anti-Friction—By H. E. Brunner. 1924—179.
Bearings—Application of Anti-Friction—By F. W. Gurney. 1924—147.
Bearing Applications—Topical Discussion—Developments in Ball and Roller—By Membership, A. I. & S. E. E. 1927—9.
Bearing Problem—An Analysis of the Motor—By F. W. Cramer. 1927—227.
Bearings—Application of Taper Roller—By T. V. Buckwalter. 1924—133.
Bearings and Their Applicability to Steel Mill Equipment—Tapered Roller—By F. Waldorf. 1929-30—247.
Bearings Applied to Mill Motors—Roller—By L. J. Hess. 1922—811.
Bearings Committee of A. I. & S. E. E. for 1923—Report of Special—By D. M. Petty, Chairman. 1923—499.
Bearings—Design and Application of Ball—By T. D. Crow. 1924—233.
Bearings for Auxiliaries in the Iron and Steel Industry—Anti-Friction—By E. S. Jefferies. 1928-29—184.
Bearings for Electric Motors—Anti-Friction—By J. S. Murray. 1928-29—185.
Bearings for Roll Necks—Anti-Friction—By J. H. Van Campen. 1928-29—250.
Bearings for Roll Necks—Factors Governing the Design of Roller—By F. H. Buhlmann. 1927—208.
Bearings for Use in Rolling Mills—By C. J. Klein. 1927—149.
Bearings for Use on Roll and Pinion Necks—A. I. & S. E. E. Questionnaire—Anti-Friction Bearings. 1928-29—80.
Bearings in Electric Motors—Mounting and Maintenance of Roller—By U. B. Wachtler. 1924—207.
Bearings in the Iron and Steel Industry—A Review of the Proceedings of the A. I. & S. E. E. in Connection with the Development of Anti-Friction. 1929-30—181.
Bearings in the Steel Mill—Anti-Friction—By A. M. MacCutcheon. 1921—429.
Bearings—Introduction: Ball and Roller—By D. M. Petty, Chairman, Special Bearings Committee, A. I. & S. E. E. 1924—131.
Bearings on Electric Motors—Mounting and Maintenance of Roller—By D. E. Batesole. 1924—155.
Bearings on Mill and Crane Motors—Special Study Regarding Lubrication of Anti-Friction—A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan, Chairman. 1928-29—701.
Bearings on Roll Necks of Rolling Mills—Anti-Friction—By E. C. Gainsborg. 1927—184.
Bearings on Roll Necks of Rolling Mills and Pinion Stands—Application of Tapered Roller—By Fred Waldorf. 1927—178.
Bearings—Report of the A. I. & S. E. E. 1929-30 Special Committee on—By F. D. Egan, Chairman. 1929-30—460.
Bearings—Selection, Installation and Operation of Anti-Friction—By J. R. T. Bell. 1924—193.
Bearings to General Electric Co. MD Motors—Application of Roller—By C. W. Lange. 1928-29—664.
Bearings to Roll Necks of Steel Mills—Application of Anti-Friction—By E. C. Gainsborg. 1927—36.
Bearings to Roll and Pinion Necks—Application of Anti-Friction—By D. M. Petty. 1928-29—288.
Bearings to Steel Mill Machinery—Application of Anti-Friction—By G. R. Holmes. 1926—16.
Bearings, 1928-29—Report of the Special Committee on—A. I. & S. E. E.—By F. D. Egan. 1928-29—656.
Bell Hoists—Blast Furnace Skip and—By A. E. Handy. 1912—15.
Bell Hoists—Electric Skip Hoists and—By H. D. James and F. J. Burd. 1917—17.
Bell Hoists for Blast Furnaces—Recent Developments of Electric Skip Hoists and—By D. L. Lindquist. 1918—43.
Bent Tube vs. Straight Tube Boilers—By W. N. Flanagan. 1922—321.
Bessemer Process of Making Steel—By John Sullivan. 1921—91.
Bethlehem Steel Co.—Features of the New Electrical Installations at the Cambria Plant of the—By F. W. Cramer. 1926—278.

Bethlehem Steel Company's New Gautier Mills from a Safety Standpoint—By J. A. Northwood. 1926—309.
Bethlehem Steel Co., Johnstown, Pa.—New Rolling Mills—Gautier Plant, Cambria Works—By H. R. Stevens. 1926—281.
Bethlehem Steel Co.—Switching Instructions—Electrical Department, Lackawanna Plant. 1928-29—34.
Bethlehem Steel Co.—The Electrical Development at the Lackawanna Plant of the—By F. D. Egan and J. F. Oehler. 1929-30—419.
Better Practice in the Operation of Stokers and Boilers—Fuel Economy by Co-Operation in Establishing a—By J. G. Worker. 1917—465.
Betty Furnace, Central Alloy Steel Corp.—A Year's Operation of Power Plant at—By J. D. Donovan. 1927—500.
Big Four of Safety—The—By J. A. Oartel. 1926—XIII.
Billet Heating Furnaces—Continuous Bloom and—By E. W. Trexler. 1926—190.
Billet Mill Drives—Bar and. 1929-30—231.
Bills on Mine Fans with Synchronous Motors—Reducing Power—By F. W. Cramer and A. A. MacDonald. 1922—213.
Bindings—Furnace—By A. R. Tegge. 1928-29—581.
Blast Furnace and Coke Oven Gas on Open Hearth Furnaces at Wisconsin Steel Works—Use of Mixed Gas—By G. E. Rose and F. M. Washburn. 1929-30—574.
Blast Furnace Control—Blast Furnace Flue Dust and—By E. Kieft. 1927—241.
Blast Furnace Flue Dust and Blast Furnace Control—By E. Kieft. 1927—241.
Blast Furnace Gas and Air for Blowing a Gas Producer—The Application of—By G. R. McDermott. 1925—126.
Blast Furnace Gas—Certain Principles in the Extended Utilization of—By Owen R. Rice. 1928-29—568.
Blast Furnace Gas Cleaning—By C. W. Hedberg. 1928-29—707.
Blast Furnace Gas Cleaning—By W. J. McGurty. 1928-29—705.
Blast Furnace Plant—Power Generation By—By O. C. Callow. 1925—101.
Blast Furnace—Physical and Chemical Conditions in the Interior of the—By S. P. Kinney. 1929-30—104.
Blast Furnace Power Plant—New—Fairfield Works, Tennessee Coal Iron and Railroad Company—By J. M. Sprague. 1928-29—721.
Blast Furnace Skip and Bell Hoists—By A. E. Handy. 1912—15.
Blast Furnace Skip Hoists—Ward-Leonard Control as Applied to—By E. Anderson. 1928-29—477.
Blast Furnace—The Automatic—By F. W. Cramer. 1925—88.
Blast Furnace Skip Hoist Characteristics—Single Bucket—By A. C. Cummins and A. R. Leavitt. 1923—453.
Blast Furnace Theory and Practice—Modern—By R. H. Sweetser and S. P. Kinney. 1929-30—100.
Blast Furnaces and Skip Hoists—Ore Unloaders—By D. W. Blakeslee. 1926—317.
Blast Furnaces—Notes on the Damping Down and Restarting of—By C. S. Gill. 1929-30—80.
Blast Furnaces—Recent Developments of Electric Skip Hoists and Bell Hoists for—By D. L. Lindquist. 1918—43.
Bloom and Billet Heating Furnaces—Continuous—By E. W. Trexler. 1926—190.
Bloom Shear Without Clutch—Motor Driven—By D. W. Dean. 1926—227.
Blooming Mill Drive—Specifications for 40" Reversing. 1928-29—404.
Blooming Mill Drives. 1929-30—217.
Blooming Mill—Engine vs. Motor Drive for Reversing—By C. H. Hunt. 1924—547.
Blooming Mill—Manipulators for Two High Reversing—By C. J. Klein. 1926—274.
Blooming Mill—Operating Characteristics of an Electric Reversing—By E. S. Jefferies. 1916—309.
Blooming Mill Screwdown—Mechanical and Electrical Analysis of 40-Inch—By F. D. Egan. 1924—487.
Blooming Mill—Wisconsin Steel Co.—40" Reversing—By F. A. Wiley. 1928-29—58.
Blooming Mills—Electrical Reversing—By Ralph D. Nye. 1917—351.
Blooming Mills—Manipulators for—By L. Iverson. 1926—272.
Blowing a Gas Producer—The Application of Blast Furnace Gas and Air for—By G. R. McDermott. 1925—126.
Boiler Development—The Trend of—By J. B. Crane. 1922—557.
Boiler Installations in Steel Works—Trend of Recent—By W. B. Skinkle. 1927—1.
Boiler Operation—The Control of—By W. N. Flanagan. 1921—295.
Boiler Plant Installation at Edgar Thomson Works, Carnegie Steel Co.—Recent—By R. D. Abbiss. 1927—191.
Boiler Practice of 1922—By R. E. Butler—1922-561.
Boiler Practice in 1922—Heine—By E. R. Fish and Albert Cotton—1922-572.
Boiler Pressure Above 500 Pounds—By J. B. Crane. 1928-29—179.
Boiler Rooms by the Use of Preheated Air for Combustion Purposes—Extending the Heat Cycle in—By J. G. Worker. 1925—274.
Boiler Rooms—Measurement of Input and Output in—By J. M. Spitzglass. 1924—317.
Boiler—The Modern Sectional Header—By R. M. Rush—1922—569.
Boiler Troubles from the Operating Man's Standpoint—By C. J. Smith. 1923—343.
Boiler Water Conditioning—Some Results of—By R. E. Hall. 1928-29—681.
Boiler Water Conditioning—The Prevention of Scale Formation by—By R. E. Hall, Carl Fischer and G. W. Smith. 1924—353.
Boilers—Bent Tube vs. Straight Tube—By W. N. Flanagan. 1922—321.
Boilers—Factors Which Influence the Choice of Waste Heat—By J. B. Crane. 1928-29—343.
Boilers—Fuel Economy by Co-operation in Establishing a Better Practice in the Operation of Stokers and—By J. G. Worker. 1917—465.
Boilers—High Pressure Steam—By D. S. Jacobus. 1923—753.
Boilers to Open Hearth Furnaces—Application of Waste Heat—By Thomas R. Tate. 1920—641.
Braize—Coke—By G. C. Emmons. 1925—133.
Brakemen—Safety Rules Governing Locomotive Crane Operators and—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Brakes—Magnetic—By B. E. Fernow, Jr. 1914—611.
Braking and Regenerative Braking—Grab Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic—By James Farrington and R. H. McClain. 1917—439.
Braking—Dynamic—By R. B. Davenport. 1912—401.
Braking—Grab Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative—By James Farrington and R. H. McClain. 1917—439.
Braking Lowering—Recent Developments in Dynamic—By D. C. Wright. 1929-30—263.
Braking—Mechanical vs. Dynamic—By G. W. Richardson. 1921—265.
Brass and Non-Ferrous Mill Drives—Aluminum, Copper. 1929-30—229.
Breakers—Selection and Maintenance of Oil Circuit—By M. J. Wohlgemuth and E. K. Read. 1925—288.
Breakers—The Selection and Maintenance of Oil Circuit—By G. A. Burnham. 1925—267.
Breeze—Generation of Steam from Coke—By John Van Brunt. 1925—131.
Bridge Motors for Overhead Traveling Cranes—By R. H. McClain. 1918—347.
Bridge Transverse Control for Protection Against Wind and Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore—By P. R. Canney. 1923—421.
Bridges—A System of Coal and Ore Bridge Transverse Control for the Protection Against Wind and Skewage Hazards of the Skew Type Direct Current—By P. R. Canney. 1923—421.
Bridges—Controllers for Ore Unloaders and Ore—By N. L. Mortenson. 1923—1.
Bridges—Direct Current Hoist and Trolley Control for Ore—By N. L. Mortenson. 1924—879.
Brier Hill Sheet Mill, Youngstown Sheet & Tube Company—Electrical Installations—By E. F. Rhodes. 1925—84.
Brier Hill Sheet Mill, Youngstown Sheet & Tube Company—Heating Furnaces—By Strickland Kneass, Jr. 1925—85.

Brier Hill Sheet Mill of Youngstown Sheet & Tube Company—Mechanical Installations—By E. L. McElhinney. 1925—82.
Brier Hill Steel Company Plant at Youngstown, Ohio, May 17, 1919—Inspection Trip. 1919—155.
Bright Annealing Furnace—Experiences with Electrical—By A. Pomp. 1927—377.
Bright Annealing Furnace—Tests with an Electrical—By E. Schreiber. 1927—379.
Brush Standardization as Viewed by Designing Engineer—Carbon—By A. M. MacCutcheon. 1928-29—507.
Brush Standardization—Carbon—By F. W. Cramer. 1928-29—506.
Brushes for Motors and Generators—Carbon—By G. M. Little. 1928-29—514.
Brushes—Manufacture, Selection and Use of Carbon—By E. H. Martindale. 1917—399.
Brushes—Selection of Carbon—By G. Williamson. 1928-29—511.
Brushes—The Proper Selection of Carbon—By L. A. Heath. 1921—51.
Brushes—The Selection and Application of Direct Current—By R. H. Newton. 1928-29—531.
Brushes—The Selection and Operation of Carbon—By W. P. Poynton. 1913—9.
Brushes to Direct Current Machines—Factors Affecting the Application of Carbon—By C. W. Lange. 1928-29—509.
Bucket Blast Furnace Skip Hoist Characteristics—Single—By A. C. Cummins and A. R. Leavitt. 1923—453.
Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking—Grab—By James Farrington and R. H. McClain. 1917—439.
Buildings—Arc Welded Structural Steel—By C. G. Watson. 1927—53.
Buildings by Electricity—Specifications for Welding Steel—By Frank P. McKibben. 1929-30—86.
Buildings—Detailing of Welded Steel—By E. C. Brown. 1928-29—504.
Built by the General Electric Company for Mill Service—Apparatus—By D. B. Rushmore. 1907—Paper 3.
Burning and Steam Generation During 1928—Review of Certain Developments in Fuel—By Carl Stripe. 1928-29—461.
Burning of Fuel and the Use of Waste Gases in Iron and Steel Plants—The Efficient—By W. W. Pettibone. 1922—49.
Burning Oil—A Recuperator Unit for Industrial Furnaces—By A. E. Walden. 1928-29—281.
Business Aspects of the Furnace Manufacturer—Some of the—By F. C. Manker. 1929-30—132.
By-Product Coke Ovens—By James Farrington. 1917—227.
By-Product Coke Plant—Refractory Problems—By M. J. Conway. 1926—180.
By-Product Gas to Industry—Value of—By H. Dobrin. 1922—79.
By-Product Plants—Alternating Current in—By W. V. Dunn. 1921—249.
By-Product Plants—Direct Current in—By E. P. Winters. 1921—257.
By-Products of Safety—The—By J. A. Oartel. 1929-30—409.

C

Cable Construction—Electrolysis and Modern—By W. W. Walsh. 1919—97.
Cables and Accessories—Underground—By J. C. Bowman. 1914—317.
Cables—Ductless Electric Power—By C. F. Hood. 1927—45.
Cables—Heating of Underground—By A. L. Freret. 1919—209.
Cables—Practical Installations of Underground—By P. H. Torchio. 1923—269.
Cables—Spacing of Heavy Capacity, Low Voltage—By W. H. Boyce. 1928-29—32.
Cables—Underground—By C. R. Sturdevant. 1912—307.
Calculations—Curves and Data for Illumination—By C. J. Mundo. 1912—188.
Cambria Plant of the Bethlehem Steel Co.—Features of the New Electrical Installations at the—By F. W. Cramer. 1926—278.
Cambria Works, Bethlehem Steel Co., Johnstown, Pa.—New Rolling Mills—Gautier Plant—By R. H. Stevens. 1926—281.
Canada—Main Roll Drives in the United States and. 1929-30—198.
Candle Power Mazda Lamps for Steel Mill Lighting—High—By G. H. Stickney. 1914—649.
Capacity—Increased Requirements of Switching Equipment Due to Increased Service—By W. H. Andrew. 1928-29—441.
Carbon Brush Standardization—By F. W. Cramer. 1928-29—506.
Carbon Brush Standardization as Viewed by a Designirg Engineer—By A. M. MacCutcheon. 1928-29—507.
Carbon Brushes for Motors and Generators—By G. M. Little. 1928-29—514.
Carbon Brushes—Manufacture, Selection and Use of—By E. H. Martindale. 1917—399.
Carbon Brushes—Selection of—By G. Williamson. 1928-29—511.
Carbon Brushes—The Proper Selection of—By L. A. Heath. 1921—51.
Carbon Brushes—The Selection and Operation of—By W. P. Poynton. 1913—9.
Carbon Brushes to Direct Current Machines—Factors Affecting the Application—By C. W. Lange. 1928-29—509.
Carbon Tetrachloride Fuses—Outdoor Substation Practice and Use of—By Alfred Alsaker. 1919—55.
Care and Operation—Electric Mining Equipment, Its Selection—By A. F. Elliott. 1924—871.
Care and Operation of Power Transformers—By J. G. Corrin. 1922—23.
Carnegie Steel Co.—History of the Edgar Thomson Works of the—By L. C. Edgar. 1928-29—116.
Carnegie Steel Company's McDonald Mills—Inspection Trip of. 1918—219.
Carnegie Steel Co., Munhall, Pa.—Electrical Installations Structural Mills, Homestead Steel Works—By C. A. Menk. 1927—214.
Carnegie Steel Co.—Recent Boiler Plant Installation at Edgar Thomson Works—By R. D. Abbiss. 1927—191.
Carnegie Steel Co., Upper Union Works, Youngstown, Ohio—Frequency Converter Speed Sets—By G. P. Wilson. 1927—487.
Carpenter Steel Co., During the Last Decade—Improvements at the Plant of the—By E. J. Poole. 1926—9.
Central Alloy Steel Corp.—A Year's Operation of Power Plant at Betty Furnace—By J. D. Donovan. 1927—500.
Central Alloy Steel Corp.—High Voltage Rules—By J. D. Donovan. 1929-30—125.
Central Pumping Station—An Electrically Operated—By F. W. McKee. 1911—125.
Central Station and the Electric Furnace—The—By W. H. Cogswell. 1916—45.
Central Station Power—By Wm. H. Hornlein. 1917—667.
Central Station Power for Steel Mills—By Central Station Power Committee, A. I. & S. E. E., C. S. Lankton, Chairman. 1916—21.
Central Station Power over Steel Plant Generation—Advantages of—By D. B. Rushmore. 1916—21.
Central Station Power Rates—By E. C. Stone. 1919—223.
Central Station Power Rates—By G. M. Gadsby. 1919—238.
Central Station Power Service in Steel Mills—The Use of—By Jos. McKinley. 1916—505.
Central Station Power Supply to Iron and Steel Industry—By Joseph McKinley and R. L. Baker. 1917—339.
Central Station Power—The Electrification of Steel Mills and the Use of—By Brent Wiley and Wilfred Sykes. 1915—177.
Central Station Power to Steel Mills—Application of—By T. E. Tynes. 1916—41.
Central Stations and Steel Plants in Connection with Protective Equipment—Relation Between—By B. M. Jones. 1928-29—52.
Central Stations—Electric Heating with Special References to—By E. D. Sibley. 1924—799.
Central Stations—Frequency Converters for Interchange of Power Between Steel Mills and—By Fred J. Schwarz. 1926—79.
Central Stations—Their Economic Relations—Prime Movers for—By Edwin D. Dreyfus. 1911—138.
Centrifugal Compressors—By J. C. Callan. 1908—Paper 13.
Centrifugal Compressors—By Batt L. Spain. 1927—363.
Centrifugal Pumps in Steel Plants—Motor Operated—By B. A. Cornwell. 1923—309.
Centrifugal Pumps with Automatic Equipment—By N. C. Bye. 1928-29—279.

Centrifugal Purification of Oil—By H. T. Moore. 1928-29—331.
Certain Developments in Fuel Burning and Steam Generation During 1928—Review of—By Carl Stripe. 1928-29—461.
Certain Principles in the Extended Utilization of Blast Furnace Gas—By Owen Rice. 1928-29—568.
Certitude—What Price—By D. M. Petty. 1927—138.
Chain Power Transmission—Silent—By F. L. Morse. 1914—465.
Changer Equipment—Speed Regulating, Induction Motor Synchronous Generator, Frequency—By H. C. Uhl. 1926—83.
Changers—The Operation of Frequency—By L. M. Smith. 1922—773.
Chapman Stein Recuperator—The—By W. C. Buell. 1924—393.
Characteristics—Magnetic Control—By H. F. Stratton. 1914—211.
Characteristics—of Insulators—Mechanical Design—By G. M. Barrow. 1928-29—305.
Characteristics of an Electric Reversing Blooming Mill—Operating—By E. S. Jefferies. 1916—309.
Characteristics of Cold Rolling Mill Machinery—By J. H. Van Campen. 1928-29—273.
Characteristics of Direct Current and Induction Motors—Control—By M. A. Whiting. 1913—37.
Characteristics of Steel Mill Synchronous Motors—Starting—By H. H. Angel. 1928-29—539.
Characteristics—Single Bucket Blast Furnace Skip Hoist—By A. C. Cummins and A. R. Leavitt. 1923—453.
Cheap Oxygen in Economy of Fuel and of Time—The Influence of—By E. A. W. Jefferies. 1921—329.
Chemical Conditions in the Interior of the Blast Furnace—Physical and—By S. P. Kinney. 1929-30—104.
Chief Features of Basic Open Hearth Construction—By M. J. Conway. 1929-30—318.
Choice of Waste Heat Boilers—Factors Which Influence the—By J. B. Crane. 1928-29—343.
Circuit Breakers—Selection and Maintenance of Oil—By M. J. Wohlgemuth and E. K. Read. 1925—288.
Circuit Breakers—The Selection and Maintenance of Oil—By G. A. Burnham. 1925—267.
Circuits—Electrical Safety—Their Uses and Construction—Discussion. 1928-29—42.
Circuits—Recent Developments in Switching Devices for Power—By J. N. Mahoney. 1913—77.
Circuits—Their Uses and Construction—Electrical Safety—By W. M. Runyon. 1927—248.
Cleaning Air By the Adhesive Impingement Method—By J. H. Milliken. 1929-30—55.
Cleaning—Blast Furnace Gas—By C. W. Hedberg. 1928-29—707.
Cleaning—Blast Furnace Gas—By W. J. McCurty. 1928-29—705.
Closing Receptacles Containing Inflammable Fluids—Automatically Opening and—By Walter Greenwood. 1928-29—444.
Clutch—Motor Driven Bloom Shear Without—By D. W. Dean. 1926—227.
Coal and Ore Bridge Transverse Control for Protection Against Wind and Skewage Hazards of Skew Type Direct Current Bridges—A System of—By P. R. Canney. 1923—421.
Coal—Electricity Applied to the Mechanical Mining of—By C. B. Reed. 1919—179.
Coal—Factors Governing the Purchase of—By Morgan B. Smith. 1928-29—172.
Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking—Grab Bucket—By James Farrington and R. H. McClain. 1917—439.
Coal—Steel Plant Power Generation from Waste Heat and—By B. H. Greene. 1920—21.
Coal—The Tempering of—By T. A. Marsh. 1923—367.
Coal to Industrial Furnaces—The Application of Pulverized—By W. A. Shoudy. 1928-29—123.
Coal to Metallurgical Furnaces—Application of Pulverized—By W. O. Renkin. 1929-30—19.
Coils—Direct Current Motor Field—By R. B. Treat. 1912 125.
Coke Braize—By G. C. Emmons. 1925—133.
Coke Breeze—Generation of Steam from—By John Van Brunt. 1925—131.
Coke—Dry Quenching of—By Walter Sennhauser. 1928-29—118.
Coke Dry Quenching Practice—By W. E. Bisler. 1928-29—696.
Coke Oven Gas—Flow Measurement in Connection with—By J. M. Spitzglass. 1929-30—381.
Coke Oven Gas—on Open Hearth Furnaces at Wisconsin Steel Works—The Use of Mixed Gas Blast Furnace and—By G. E. Rose and F. M. Washburn. 1929-30—574.
Coke Ovens—By Product—By James Farrington. 1917—227.
Coke Plant—Refractory Problems By-Product—By M. J. Conway. 1926—180.
Cold Roll Drives. 1929-30—233.
Cold Rolling Limitations—Mills of the Backed Up Type Remove—By Lloyd Jones. 1927—498.
Cold Rolling Mill Machinery—Characteristics—By J. H. Van Campen. 1928-29—273.
Cold Rolling of Strip Steel—By H. C. Uhl. 1928-29—106.
Colleges and Universities Create a Safety Engineering Course—Should—By J. A. Voss. 1929-30—446.
Combination Manual and Magnetic Switch Controllers—By H. F. Stratton. 1908—Paper 9.
Combustion and Its Application—Surface—By W. M. Hepburn. 1923—537.
Combustion Control—By E. G. Bailey. 1924—709.
Combustion Control—By T. A. Peebles. 1925—149.
Combustion Control—By G. S. Carrick. 1925—151.
Combustion Control and Regulation—By J. F. Shadgen. 1928-29—50.
Combustion Control—Automatic—By E. G. Bailey. 1925—150.
Combustion Control By Machinery—By C. H. Smoot. 1925—143.
Combustion Control for Industrial Furnaces—By F. J. Ryan. 1927—493.
Combustion Control of Open Hearth—By M. J. Conway. 1925—377.
Combustion—Developments in the Field of—By H. V. Flagg. 1929-30—178.
Combustion—Economical—By W. P. Chandler Jr. 1929-30—545.
Combustion—Economics of—By J. B. Crane. 1929-30—361.
Combustion Engines for Power Generation in Steel Plants—Internal—By D. M. Petty. 1922—709.
Combustion Flame Electrode—By George T. Southgate. 1923—87.
Combustion of Gaseous Fuels from Gas Analysis—Judging the—By A. G. Witting. 1922—499.
Combustion of Liquid Fuel—By Robert C. Vroom. 1928-29—640.
Combustion—Proper for Furnaces—By W. P. Chandler, Jr. 1928-29—14.
Combustion Purposes—Extending the Heat Cycle in Boiler Rooms by the Use of Preheated Air for—By J. G. Worker. 1925—274.
Combustion Section, A. I. & S. E. E.—By W. P. Chandler, Jr. 1925—VIII.
Combustion Work—Employees Training for—By W. P. E. Ainsworth. 1928-29—484.
Comments on Safety Committee Work—By the Safety Committee, W. Greenwood, Chairman. 1921—597.
Commutation—Elements of—By Jerry Albrecht, A I. & S. E. E., Junior Division. 1928-29—494.
Commutating Pole Mill Type Motor—Standardized—By Standardization Committee, A. I. & S. E. E., A. C. Cummins, Chairman. 1926—262.
Companionate Prosperity—By Robert W. Wolcott. 1928-29—454.
Comparative Value of Fuels in Steel Mills—By H. V. Flagg. 1929-30—367.
Complete Electrification of the Foundry Industry—The—By L. W. Egan. 1923—377.
Comply with Requirements of Safety—Installation of Electrical Equipment to—By W. Greenwood. 1915—299.
Compressors—Centrifugal—By J. C. Callan. 1908—Paper 13.
Compressors—Centrifugal—By Batt L. Spain. 1927—363.
Compressor Plants for Avoidance of Explosions—Installation and Operation of Air—By W. Greenwood. 1927—126.

Concerning Auxiliary Drives—Considerations—By Gordon Fox. 1920—343.
Concrete Poles—Reinforced—By Robert Cummings. 1912—343.
Condenser and Condenser Engineering Practice—By D. D. Pendleton. 1918—385.
Condenser Engineering Practice—Condensers and—By D. D. Pendleton, 1918—385.
Condenser Installation for Power Factor Correction and Voltage Regulation—A Synchronous—By W. O. Oschmann. 1914—109.
Condenser—Leblanc—By Edwin Yawger. 1909—Paper 11.
Condenser on Steel Mill Loads—The Static—By R. W. Dudley. 1925—106.
Condensers and Their Auxiliaries—By R. N. Ehrhart. 1914—543.
Condensers—Installation and Operation of Static—By F. T. Vanderwaart. 1923—739.
Conditioning Equipment—Air—By W. H. Burr. 1928-29—275.
Conditioning—Some Results of Boiler Water—By R. E. Hall. 1928-29—681.
Conditioning—The Prevention of Scale Formation by Boiler Water—By R. E. Hall, Carl Fischer and G. W. Smith. 1924—353.
Conditions in the Interior of the Blast Furnace—Physical and Chemical—By S. P. Kinney. 1929-30—104.
Conditions of a Steel Mill as a Factor in Safety—Physical—By H. W. Darr. 1928-29—282.
Conductors for Transmission Lines—Steel—By H. R. Dwight. 1916—205.
Conference—Electric Heating—A. I. & S. E. E. and Pennsylvania State College. 1929-30—281.
Connected Direct—Current Motors Permanently in Series or Permanently in Parallel—The Operation of Mechanically—By H. F. Stratton. 1916—655.
Connected Hot Saws—Direct—By Nelson D. Cooper. 1927—71.
Connected Reversing Motor Drive for Planers—Direct—By G. W. Richardson. 1911—43.
Connection with Coke Oven Gas—Flow Measurement in—By J. M. Spitzglass. 1929-30—381.
Connection to Damper Regulators—Discussion—Steam—By J. J. Neville. 1927—486.
Connection with Heating Furnaces—Discussion in—By A. F. Mitchell. 1924—571.
Connection with Motor Driven Rollers—Pressent Practices in—By J. C. Dobelbower. 1928-29—177.
Connection with Protective Equipment—Relation Between Central Stations and Steel Plants in—By B. M. Jones. 1928-29—52.
Connection with the Development of Anti-Friction Bearings in the Iron and Steel Industry—A Review of the Proceedings of A. I. & S. E. E. in. 1929-30—181.
Conservation of Low Grade and Waste Gases—Foreign Practice and Some Examples of the Tendency Toward—By J. C. Hayes. 1928-29—695.
Conservation—The Relation of the Engineer to Fuel—By J. W. Hays. 1922—395.
Conservative Economy in Power Service—By D. M. Petty. 1928-29—146.
Consideration of Safety in the Design of Standard Apparatus—By C. V. Pirtle. 1910—22.
Considerations Concerning Auxiliary Drives—By Gordon Fox. 1920—343.
Considerations in Design of Electrical Arc Welding Apparatus—Some Practical and Theoretical—By Robert E. Kinkead. 1919—614.
Considerations in Design of Power Plants for Steel Mills—Some Economic—By T. A. Keating. 1920—455.
Considerations in the Electrifications of the Steel Plant Railroad Yard—By R. B. Gerhardt. 1922—461.
Considerations of Power Factor Correction—Some Fundamental—By R. A. McCarty. 1918—19.
Considered from the Standpoint of Tonnage—The Electric Reversing Mill—By K. A. Pauly. 1920—415.
Considered—Some Electrical Problems Practically—By B. G. Lamme. 1914—13.
Construction—Chief Features of Basic Open Hearth—By M. J. Conway. 1929-30—318.
Construction—Electrical Safety Circuits—Their Uses and—By W. M. Runyon. 1927—248.
Construction—Electrolysis and Modern Cable—By W. W. Walsh. 1919—97.
Construction for Steel Mills—Power Transformer—By G. A. Waters. 1914—391.
Construction—Open Hearth Roof—By W. J. Harper. 1926—178.
Construction—Tubular Poles for Line—By W. T. Snyder. 1912—322.
Consumption—Steel Production and Fuel—By E. Kieft. 1926—298.
Contact to Industrial Haulage—The Application of the Principle of Surface—By Chas. L. Kinsloe. 1915—441.
Contactor Wear in Auxiliary Steel Mill Drives—Influence of Gear Ratio on Speed of Operation, Motor Heating and—By J. E. Fries. 1919—671.
Containing Inflammable Fluids—Automatically Opening and Closing Receptacles—By Walter Greenwood. 1928-29—444.
Continental Europe—Observations on Rolling Mill Drives in—By O. Needham. 1925—187.
Continuous Bloom and Billet Heating Furnaces—By E. W. Trexler. 1926—190.
Continuous Mills—Application of Synchronous Motors to—By F. O. Schnure. 1925—86.
Continuous Mills—Practical Operation of Motor Driven—By H. C. Cronk. 1918—35.
Continuous Normalizing Furnaces—Fuel for—By J. W. Jones. 1928-29—696.
Continuous Rated or 50 Degree Rise Motors—By L. F. Adams. 1921—21.
Contracts—Rates and—By E. T. Selig. 1916—28.
Contribution of Safety to the Iron and Steel Industry—By J. A. Oartel. 1928-29—148.
Contribution to the Iron and Steel Industry—Electricity's. 1929-30—198.
Control and Automatic Acceleration of Electric Motors—The Auxiliary—By E. W. Yearsley. 1909—Paper 1.
Control and Regulation—Combustion—By J. F. Shadgen. 1928-29—50.
Control Apparatus for Steel Mills—New Developments in—By M. A. Whiting. 1911—13.
Control Applications—New and Interesting Auxiliary Motor and—By Phelan McShane. 1926—328.
Control as Applied to Blast Furnace Skip Hoists—Ward Leonard—By E. Anderson. 1928-29—477.
Control—Automatic Combustion—By E. G. Bailey. 1925—150.
Control—Automatic Motor—By A. C. Eastwood. 1911—25.
Control—Blast Furnace Flue Dust and Blast Furnace—By E. Kieft. 1927—241.
Control by Machinery—Combustion—By C. H. Smoot. 1925—143.
Control Characteristics—Magnetic—By H. F. Stratton. 1914—211.
Control Characteristics of Direct Current and Induction Motors—By M. A. Whiting. 1913—37.
Control—Combustion—By E. G. Bailey. 1924—709.
Control—Combusion—By T. A. Peebles. 1925—149.
Control—Combustion—By G. S. Carrick. 1925—151.
Control Committee, A. I. & S. E. E. for 1922—Report of—By F. W. Cramer, Chairman. 1922—621.
Control—Developments in—By W. H. Williams. 1929-30—398.
Control Diagrams—Standardization of—By O. C. Callow. 1927—139.
Control Diagrams—Standardization of Steel Mill Magnetic. 1929-30—547.
Control—Direct Current Motor, A. I. & S. E. E. Junior Division. 1928-29—138.
Control Equipment for Auxiliary Motors—By J. D. Wright. 1921—615.
Control—Foot—By G. J. Walz. 1923—46.
Control for Auxiliary Motors—Alternating Current and Direct Current Magnetic—By W. O. Lum. 1914—239.
Control for Direct Current Motors—Time Current—By D. C. Wright. 1929-30—3.
Control for Industrial Furnaces—Combustion—By F. J. Ryan. 1927—493.
Control for Motors—Magnetic and Mechanical—By C. T. Henderson. 1907—Paper 12.
Control for Ore Bridges—Direct Current Hoist and Trolley By N. L. Mortenson. 1924—879.

Control for Protection Against Wind and Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore Bridge Transverse—By P. R. Canney. 1923—421.
Control for Steel Mill Auxiliaries—Magnetic—By H. H. Angel. 1926—229.
Control—Inductive Time Limit—By N. L. Mortenson. 1927—396.
Control in the Steel Industry—General Phases of Pyrometry and Temperature—By O. Brewer. 1924—11.
Control—Machine Tool—By H. W. Eastwood. 1914—585.
Control—Motor—By M. A. Whiting. 1910—42.
Control of Boiler Operation—The—By W. N. Flanagan. 1921—295.
Control of D. C. and A. C. Motors as Applied to Cranes—By Paul Caldwell. 1916—229.
Control of Induction Motors for Rolling Mill Drive—The—By Wilfred Sykes and G. E. Stoltz. 1914—357.
Control of Induction Motors for Steel Mill Drive—Speed—By J. D. Wright. 1916—693.
Control of Industrial Electric Power—Protection and—By C. P. Steimetz. 1915—15.
Control of Mill Tables and Screw Downs—By W. C. Kennedy. 1920—223.
Control of Motor Driven Auxiliary Apparatus in Steel Mills—By H. D. James. 1908—Paper 5.
Control of Open Hearths—Combustion—By M. J. Conway. 1925—377.
Control of Pressure Gas Producers—By W. P. Chandler, Jr. 1924—289.
Control of Reversing Rolling Mill Equipment—Automatic—By E. S. Lammers, Jr. 1920—137.
Control of Synchronous Motors—The Automatic—By J. H. Hall. 1927—427.
Control, Prime Movers and Motors—Transmission, Illumination, Cranes—Report of Standardization Committee for. 1918—495.
Control—Progress in Instruments and—By J. W. Jones. 1928-29—654.
Control—Recent Developments in Automatic—By H. P. Townsend. 1917—77.
Control—Recent Development in Industrial—By H. D. James. 1919—447.
Control—Report of Sub-Committee on—By F. J. Burd, Chairman. 1920—561.
Control Specification Guide Forms—Steel Mill Auxiliary—A. I. & S. E. E. 1929-30—170.
Control—The Invisible Relay in Vari—Time—By W. H. Williams, L. A. Watson and C. H. Rippel. 1928-29—270.
Control—The Isley Furnace—By G. A. Merkt. 1928-29—556.
Controlled Sub-Stations as Applied to Steel Mills—Automatic and Remote—By J. K. Ostrander. 1922—365.
Controlled Sub-Station—Remote—By W. T. Snyder. 1918—479.
Controller—Full Reverse A. C. Two Speed Mill—By E. G. Peterson. 1926—308.
Controllers and Starters—Allen—Bradley—By Lynde Bradley. 1909—Paper 6.
Controllers—Combination Manual and Magnetic Switch—By H. F. Stratton. 1908—Paper 9.
Controllers—Direct Current—Magnetic—A. I. & S. E. E. Junior Division. 1928-29—284.
Controllers for Ore Unloaders and Ore Bridges—By N. L. Mortenson. 1923—1.
Controllers—Machine Tool Drives: Motors and—By H. W. Tice. 1919—1.
Controllers—Magnetic Switch—By C. V. Pirtle. 1907—Paper 11.
Controllers—Mill Type Motors, A. C. and D. C. with—By F. D. Smalley. 1908—Paper 12.
Controllers—Standardized Mill Table—By J. S. Rowan. 1918—169.
Controlling Apparatus at Gary—New Resistance Grid Interlocking Systems—By C. T. Henderson. 1908—Paper 8.
Controlling Instruments in the Iron and Steel Industry—Recording and—By C. C. Eagle and R. M. Walker. 1928-29—205.
Controls and Their Advantages—By A. C. Eastwood. 1909—Paper 5.
Convention and Exposition—Our—By A. J. Standing. 1928-29—143.
Convention and Iron and Steel Exposition—Twenty-Sixth Annual—By F. W. Cramer. 1929-30—403.
Convention and Power Show—The Annual—By S. S. Wales. 1925—VI.
Convention—Our Twentieth Annual—By R. S. Shoemaker. 1925—VI.
Conversion of Alternating Current to Direct Current—By G. H. Finks. 1924—1.
Conversion Tables—Temperature—By American Refractories Institute. 1927—131.
Converter Speed Sets for the Carnegie Steel Company, Upper Union Works, Youngstown, Ohio—Frequency—By G. P. Wilson. 1927—487.
Converters and with Motor Generators—The Parallel Operation of Mercury Arc Rectifiers, with each other, with Rotary—By O. K. Marti. 1927—353.
Converters for D. C. Systems—Advantages of Motor Generator Sets and Rotary—By P. Lincoln. 1907—Paper 14.
Converters for Interchange of Power Between Steel Mills and Central Stations—Frequency—By Fred J. Schwarz. 1926—79.
Converters for Steel Mill Applications—Parallel Operation of Synchronous—By W. B. Shirk. 1927—356.
Converters—Motor—Generators vs. Rotary—By E. Friedlaender. 1915—57.
Converters—Parallel Operation of D. C. Generators and D. C. Generators with Synchronous—By E. Pragst. 1927—358.
Co-Operation in Establishing a Better Practice in the Operation of Stokers and Boilers—Fuel Economy by—By J. G. Worker. 1917—465.
Cooper Hewitt Lamps for Industrial Lighting—By F. R. Fortune. 1907—Paper 10.
Copper, Brass, and Non-Ferrous Mill Drives—Aluminum. 1929-30—229.
Corduroy Crane to Industrial Plants—The Application of the—By N. P. Farrar. 1928-29—588.
Correction and Its Relation to Plant Operation—Power Factor—By P. T. Vanderwaart. 1921—213.
Correction and Voltage Regulation—A Synchronous Condenser Installation for Power Factor—By W. O. Oschmann. 1914—109.
Correction, Effective Power and Reactive Power—Power Factor—By W. H. Feldmann. 1927—389.
Correction of Unsafe Practices in Foundries—By Nelson H. Kyser. 1928-29—409.
Correction—Some Fundamental Considerations of Power Factor—By R. A. McCarty. 1918—19.
Corrects Power Factor—The Motor that—By H. Weischel. 1924—43.
Cost and Efficiency of Alternating vs. Direct Current Motors for Steel Mill Auxiliaries—By B. R. Shover and Edward J. Cheney. 1911—90.
Cost and Operating Expenses of Mixed vs. Exclusively Alternating Systems in Steel Mills—First—By Gano Dunn. 1910—65.
Cost of Producing Power—Discussion of the Elements Entering Into the—By W. B. Skinkle. 1928-29—220.
Cost of Rolling Steel in Various Mills—Review of—By G. E. Stoltz. 1921—105.
Cost Reduction—Engineering Investigation in Operating—By W. W. Garrett. 1927—136.
Cost vs. Upkeep of Direct-Current Motors—By A. M. MacCutcheon. 1916—371.
Costs—Electricity a Factor in Reduced Rolling—By C. M. Thompson, Jr. 1929-30—112.
Costs—Electrification as a Means of Reducing—By G. E. Stoltz. 1928-29—149.
Costs—Installation—By G. W. Baumgarten. 1929-30—414.
Costs of Operating Fireless Steam Locomotive in Shuttle Service at a Steel Plant—Performance and—By C. H. Hunt. 1929-30—82.
Costs—Ore Handling—By W. H. Burr. 1923—747.
Costs—Power—By R. L. Baker. 1916—22.
Costs with the Welding Arc-Cutting Steel Mill Maintenance—By A. M. Candy. 1925—8.
Cottrell Electric Precipitator—on the Mathematical Theory of the—By A. W. Simon. 1928-29—535.
Coupled to the Same Load—Operation of Series Motors in Parallel When Rigidly—By J. A. Jackson. 1927—423.
Coupling—The Mesta Flexible—By W. Trinkle. 1923—210.
Coupling—The Thomas Flexible—By J. H. Albrecht. 1923—206.

Couplings—Flexible—by P. C. Day. 1923—204.
Couplings—Flexible—By R. W. Davis. 1923—216.
Couplings—Flexible—By Gustave Fast. 1923—188.
Couplings—Flexible—By L. H. Keim. 1923—225.
Couplings—Flexible—By W. E. Trumpler. 1923—219.
Couplings for Steel Mills and Other Drives—Flexible—By J. J. Serrell. 1923—177.
Course—Should Colleges and Universities Create a Safety Engineering—By J. A. Voss. 1929-30—446.
Covers—Soaking Pit—By Louis Ellman. 1928-29—133.
Crane Discussion—General. 1929-30—340.
Crane—Electric Overhead Traveling—Questionnaire and Answers, A. I. & S. E. E., Special Committee. 1929-30—331.
Crane Hoist Travel Limit Devices—By W. Greenwood. 1924—701.
Crane Maintenance—Organized Inspection as an Aid to—By T. J. Flaherty. 1929-30—448.
Crane Motors—By G. W. Richardson. 1909—Paper 2.
Crane Motors—Special Study Regarding Lubrication of Anti-Friction Bearings on Mill and—A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan, Chairman. 1928-29—701.
Crane—New Type of Soaking Pit—By E. H. Kendall. 1907—Paper 6.
Crane Operators and Brakemen—Safety Rules Governing Locomotive—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Crane Operators Manual—Report of Educational Committee for 1921—By L. F. Galbraith, Chairman. 1921—509.
Crane Operators Physical and Mental Requirements—Safe—By C. M. Swindler. 1926—245.
Crane Problems—Some Steel Mill—By A. J. Standing. 1923—33.
Crane Runways—Crane Track Wheels and—By R. J. Harry. 1929-30—324
Crane—Specifications—A. I. & S. E. E. Electric Overhead Traveling. 1929-30—520.
Crane Specifications—Modern Steel Mill—By F. D. Egan. 1916—745.
Crane Statistics—1929 Electrically Operated. 1929-30—196.
Crane to Industrial Plants—The Application of the Corduroy—By N. P. Farrar. 1928-29—588.
Crane Track Wheels—By E. S. Sawtelle. 1929-30—364.
Crane Track Wheels—By W. T. Snyder. 1911—72.
Crane Track Wheels and Crane Runways—By R. J. Harry. 1929-30—324.
Crane Wire Diagram—Electric—By G. W. Richardson. 1923—36.
Crane—10-Ton Overhead Traveling—By Cleveland Crane & Engr. Co. 1927—483.
Cranes—A. I. & S. E. E. Recommendations Covering Rules for the Safe Operation of Electric Overhead Traveling. 1926—89.
Cranes and Machine Tools—Standardization of Electrical Apparatus for—By H. Cosden. 1917—663.
Cranes—Bridge Motors for Overhead Traveling—By R. H. McClain. 1918—347.
Cranes—Control of A. C. and D. C. Motors as Applied to—By Paul Caldwell. 1916—229.
Cranes, Control, Prime Movers and Motors—Transmission, Illumination—Report of Standardization Committee for. 1918—495.
Cranes—Electric—By F. H. Woodhull. 1923—41.
Cranes for Steel Mills—By J. Matthewson. 1929-30—28.
Cranes for Steel Mills, Manufactured by the Alliance Machine Company—Latest Developments of Electric—By E. H. Kendall. 1915—281.
Cranes, Heavy Duty Steel Mill Service—General Specifications for Electric Overhead Traveling—By the Crane Standardization Committee of 1921—By F. W. Cramer, Chairman. 1921—403.
Cranes—Hoist Travel Limits on Overhead—By Walter Greenwood. 1929-30—359.
Cranes—Lubrication and Methods of Lubricating—By T. E. Tynes. 1911—68.
Cranes—Main Hoists for Open Hearth Ladle—By W. W. Garrett, Jr. 1919—271.
Cranes—New Types of Soaking Pit—By D. Kendall. 1907—Paper 6.
Cranes—Overload Protection on—By A. G. Place. 1919—545.
Cranes—Report of Sub-Committee on—By E. S. Lammers, Jr. 1920—539.
Cranes—Rules for Safe Operation of Electric—By Safety Committee, A. I. & S. E. E. 1918—273.
Cranes—Safe Operation of Electric Overhead Traveling—By Membership. 1926—56.
Cranes—Some Modern Types of Steel Mill—By W. D. Keller. 1927—244.
Cranes—Spring End Trucks for—By John Minty. 1929-30—59.
Cranes—Worm Gearing for Electric—By G. W. Richardson. 1925—87.
Create a Safety Engineering Course—Should Colleges and Universities—By J. A. Voss. 1929-30—446.
Crocker—Wheeler Mill Motors—By Gano S. Dunn. 1908—Paper 14.
Current Control for Direct Current Motors—Time—By D. C. Wright. 1929-30—3.
Current Limiting Reactances—By R. H. Keil. 1920—481.
Curves and Data for Illumination Calculations—By C. J. Mundo. 1912—188.
Curves—Essentials of Design of Electric Industrial Furnaces and Their Application to Leveling Up Load—By G. P. Mills. 1925—11.
Cutting and Welding—Electric Arc—By C. J. Holslag. 1919—618.
Cutting Steel Mill Maintenance Costs with the Welding Arc—By A. M. Candy. 1925—8.
Cycle in Boiler Rooms by the Use of Preheated Air for Combustion Purposes—Extending the Heat—By J. G. Worker. 1925—274.
Cycles in Steel Mills—Sixty Cycles vs. Twenty Five—By J. E. Fries. 1918—543.

D

Damping Down and Restarting of Blast Furnaces—Notes on the—By C. S. Gill. 1929-30—80.
Data—Electric Heat Treating Furnace Operating—By R. W. Heller. 1927—136.
Data for Illumination Calculations, Curves and—By C. J. Mundo. 1912—188.
Data of Electrical Application in the Iron and Steel Industry in the United States—Statistical—By R. Tschentscher. 1914—83.
Data—Statistical—By Brent Wiley. 1916—40.
Decrease in Output and Value in 1927—Iron Ore Industry Records. 1928-29—48.
Demands a Knowledge of Arc Welding—Modern Structural Industry—By C. J. Holslag. 1928-29—35.
Demonstration—Flaming Arc Lamps—Their Operation and—By C. J. Toerring. 1909—Paper 12.
Department in the Iron and Steel Industry—Organization of the Electrical—By Membership, A. I. & S. E. E. 1919—369.
Departmental Organization—By R. F. Gale. 1922—805.
Departmental Organization—By L. H. Mandeville. 1922—797.
Departments to the General Manager—The Value of Efficient Service—By C. S. Proudfoot. 1928-29—601.
Depreciation of Electrical Apparatus—Repair and—By G. E. Stoltz. 1915—341.
Design and Application of Ball Bearings—By T. D. Crow. 1924—233.
Design and Research—Lightning Arrester—By H. M. Towne. 1926—301.
Design and Selection of Alternating Current Equipment—Effect of Transient Phenomena on the—By E. G. Merrick. 1928-29—263.
Design and Test of Susquehanna Station, Metropolitan Power Company—By J. A. Powell. 1926—48.
Design and Use of Lifting Magnets—By B. E. Fernow, Jr. 1913—101.
Design Characteristics—of Insulators—Mechanical—By G. M. Barrow. 1928-29—305.
Design—Fuel Application—The Essential Factor in Furnace—By E. J. Evans. 1925—123.
Design—Modern Trends in Stoker—By Otto De Lorenzi. 1929-30—61.
Design of Electric Industrial Furnaces and Their Application to Leveling Up Load Curves—Essenials of—By G. P. Mills. 1925—11.
Design of Electrical Arc Welding Apparatus—Some Practical and Theoretical Considerations in the—By Robert E. Kinkead. 1919—614.

Design of Power Plants For Steel Mills—Some Economic Considerations in—By T. A. Keating. 1920—455.
Design of Roller Bearings for Roll Necks—Factors Governing the—By F. H. Buhlmann. 1927—208.
Design of Standard Apparatus—Consideration of Safety in the—By C. V. Pirtle. 1910—22.
Design of Structures for Steel Works—By Charles A. Randorf. 1916—427.
Design—Recent Developments in Industrial Furnace—By G. R. McDermott. 1929-30—534.
Design—The Incorporation of Safety in Electric Station—By V. R. Bacon. 1928-29—615.
Designing Engineer—Carbon Brush Standardization as Viewed by a—By A. M. MacCutcheon. 1928-29—507.
Detailing of Welded Steel Buildings—By E. C. Brown. 1928-29—504.
Deterioration and Maintenance of Oil—By Colby W. Bryden. 1929-30—273.
Development and Manufacture of Tool Steel—Uses of Electricity in the—By O. K. Parmiter. 1929-30—293.
Development at the Lackawanna Plant of the Bethlehem Steel Company—The Electrical—By F. D. Egan and J. F. Oehler. 1929-30—419.
Development Committee for 1923—A. I. and S. E. E. Report of Electrical—By W. C. Kennedy, Ch. 1923—523.
Development Committee for 1928-29—Report of Electrical, A. I. & S. E. E.—By W. H. Burr, Ch. 1928-29—605.
Development Committee Report—Electrical—By R. B. Gerhardt, Ch. 1921—497.
Development—Generating Station—By D. B. Rushmore and E. Pragst. 1922—473.
Development—Modern Trend of Power—By Charles P. Steinmetz. 1922—357.
Development of Anti-Friction Bearings in the Iron and Steel Industry—A Review of the Proceedings of the A. I. and S. E. E. in Connection with the. 1929-30—181.
Development of Motors for Steel Mill Service—Recent—By Brent Wiley. 1911—82.
Development of the American Iron and Steel Industry—Economic and Social—By T. W. Robinson. 1927—477.
Development—Steam Turbine—By E. Pragst. 1927—39.
Development—The Trend of Boiler—By J. B. Crane. 1922—557.
Developments at Sparrows Point—Recent—By F. O. Schnure. 1928-29—470.
Developments Committee, A. I. & S. E. E.—Electrical—W. T. Snyder, Ch.—Latest Developments in New Apparatus and Appliances. 1916—533.
Developments Committee, A. I. & S. E. E., 1929-30—Report of Electrical—By W. H. Burr, Ch. 1929-30—451.
Developments Committee of A. I. & S. E. E.—Report of Electrical—By W. H. Burr, Ch. 1927—203.
Developments Committee Report, 1920—Electrical—By E. S. Jeffries, Ch. 1920—381.
Developments During the Year 1927, Westinghouse Electric and Manufacturing Co. 1928-29—17.
Developments During the Year 1927, General Electric Co. 1928-29—20.
Developments—Electrical—During the Year 1927—By Walter Burr. 1928-29—15.
Developments in Arc Welding—Some Recent—By K. L. Hansen. 1929-30—283.
Developments in Automatic Control—Recent—By H. P. Townsend. 1917—77.
Developments in Ball and Roller Bearing Applications—Topical Discussion—By Membership, A. I. & S. E. E. 1927—9.
Developments in Control—By W. H. Williams. 1929-30—398.
Developments in Control Apparatus for Steel Mills—New—By M. A. Whiting. 1911—13.
Developments in Dynamic Braking Lowering—Recent—By D. C. Wright. 1929-30—263.
Developments in Electric Apparatus—New—By K. A. Pauly. 1909—Paper 7.
Developments in Electric Maintenance Shop Practice—By A. C. Cummins. 1924—579.
Developments in Electrical Equipment—Some of the Latest—By K. A. Pauly. 1915—81.
Developments in Fuel Burning and Steam Generation During 1928—Review of Certain—By Carl Stripe. 1928-29—461.
Developments in Induction Motor Starting—Some Recent—By M. C. Spencer. 1921—277.
Developments in Industrial Furnace Design—Recent—By G. R. McDermott. 1929-30—534.
Developments in New Apparatus and Appliances—Latest—By Electrical Developments Committee, A. I. & S. E. E.—W. T. Snyder, Ch. 1916—533.
Developments in Power Generating Apparatus—Recent—By P. M. Lincoln. 1915—45.
Developments in Steam Making—By Martin Frisch. 1928-29—422.
Developments in Steel Mill Drives—1928—By J. D. Wright, 1928-29—465.
Developments in Switching Devices for Power Circuits—Recent—By J. N. Mahoney. 1913—77.
Developments in the Field of Combustion—By H. V. Flagg. 1929-30—178.
Developments of Electric Cranes for Steel Mills, Manufactured by the Alliance Machine Company—Latest—By E. H. Kendall. 1915—281.
Developments of Electric Skip Hoists and Bell Hoists for Blast Furnaces—Recent—By D. L. Lindquist. 1918—43.
Developments of Motors for Steel Mill Service—Recent—By Brent Wiley. 1911—82.
Developments—Topical Discussion: Stokers and Their Recent. 1922—163.
Developments—1928 Steel Plant—By A. F. Kenyon. 1928-29—459.
Devices—Crane Hoist Travel Limit—By W. Greenwood. 1924—701.
Devices for Power Circuits—Recent Developments in Switching—By J. N. Mahoney. 1913—77.
Diagram—Electric Crane Wire—By G. W. Richardson. 1923—36.
Diagram—Standardization of Control—By O. C. Callow. 1927—139.
Diagrams—Standardization of Steel Mill Magnetic Control. 1929-30—547.
Direct Connected and Geared Main Roll Drives—Factors Involved in the Selection of—By E. A. Hurme. 1925—49.
Direct Connected Hot Saws—By Nelson D. Cooper. 1927—71.
Direct Connected Reversing Motor Drive for Planers—By G. W. Richardson. 1911—43.
Direct Current Adjustable Speed Drives. 1929-30—239.
Direct Current and Alternating Current Motors as Applied to Cranes—Control of—By Paul Caldwell. 1916—229.
Direct Current and Induction Motors—Control Characteristics of—By M. A. Whiting. 1913—37.
Direct Current Armature Windings for Multi-Polar Generators and Motors—Frog Leg Windings—By W. H. Powell and G. M. Albrecht. 1925—198.
Direct Current Bridges—A System of Coal and Ore Bridge Transverse Control for Protection Against Wind and Skewage Hazards of the Skew Type—By P. R. Canney. 1923—421.
Direct Current Brushes—Selection and Application of—By R. H. Newton. 1928-29—531.
Direct Current Distribution Systems—Grounding the Neutral for—By W. H. Price. 1919—305.
Direct Current Generators and Direct Current Generators with Synchronous Converters—Parallel Operation of—By E. Pragst. 1927—358.
Direct Current Generators—with Synchronous Converters—Parallel Operation of Direct Current Generators and—By E. Pragst. 1927—358.
Direct Current Hoist and Trolley Control for Ore Bridges—By N. L. Mortenson. 1924—879.
Direct Current in By-Product Plants—By E. P. Winters. 1921—257.
Direct Current Machines—Fabricated—By R. S. Marthens and F. T. Hague. 1929-30—117.
Direct Current Machines—Factors Affecting the Application of Carbon Brushes to—By C. W. Lange, 1928-29—509.
Direct Current Machines—The Advantages of Moderr Types of—By David Hall. 1916—83.
Direct Current Magnetic Control for Auxiliary Motors—Alternating Current and—By W. O. Lum. 1914—239.
Direct Current Magnet Controllers—A. I. & S. E. E. Junior Division. 1928-29—284.
Direct Current Metal Arc Welding—By F. T. Llewellyn. 1928-29—411.
Direct Current Mill Auxiliary Motors—Methods of Acceleration of—By C. J. Smith. 1926—16.

Direct Current Mixed Pressure Turbine Equipment, Etc.—Improving Non-Condensing Power Plant by Use of—R. F. Patterson. 1915—153.
Direct Current Motor Control—A. I. & S. E. E., Junior Division. 1928-29—138.
Direct Current Motor Field Coils—By K. B. Treat. 1912—125.
Direct Current Motors—A Steel Mill Starter for—By C. V. Pirtle. 1909—Paper 4.
Direct Current Motors—Alternating Current Phase Wound Motors vs. Adjustable Speed—By D. M. Petty. 1916—719.
Direct Current Motors and Generators—Standard Testing—A. I. & S. E. E., Junior Division. 1928-29—413.
Direct Current Motors—Cost vs. Upkeep of—By A. M. MacCutcheon. 1916—371.
Direct Current Motors for Main Roll Drive—Improved Rolling Mill Practice Obtained by the Use of—By G. E. Stoltz. 1922—849.
Direct Current Motors for Rolling Mill Table Drives—Alternating Current vs.—By W. S. Hall. 1919—419.
Direct Current Motors for Steel Mill Auxiliaries—Cost and Efficiency of Alternating vs.—By B. R. Shover and Edward J. Cheney. 1911—90.
Direct Current Motors in Steel Plants—Heavy Starting and Heavy Duty—By G. W. Richardson. 1907—Paper 2.
Direct Current Motors Permanently in Series or Permanently in Parallel—The Operation of Mechanically Connected—By H. F. Stratton. 1916—655.
Direct Current Motors—Time Current Control for—By D. C. Wright. 1929-30—3.
Direct Current Motors to Main Roll Drives—The Application of—By H. A. Winne. 1927—95.
Direct Current Systems—Advantages of Motor Generator Sets and Rotary Converters for—By P. Lincoln. 1907—Paper 14.
Direct Current—The Conversion of Alternating Current to—By G. H. Finks. 1924—1.
Direct Current Turbine Generating Units—By H. A. Rapelye. 1913—51.
Direct Current with Controllers—Mill Type Motors Alternating Current and—By F. D. Smalley. 1908—Paper 12.
Dirt on Insulators—By G. W. Lapp. 1928-29—308.
Discussion—Application of Synchronous Motors in Steel Mills. 1927—443.
Discussion—Carbon Brush Standardization—By Membership. 1928-29—520.
Discussion—Economizers—By Membership. 1929-30—147.
Discussion—Electric Transportation. 1923—782.
Discussion—Electrical Development Committee Report. 1927—436.
Discussion—Electrical Installations, New Structural Mills, Carnegie Steel Company, Munhall, Pa. 1927—452.
Discussion—Electrical Safety Circuits—Their Uses and Construction. 1928-29—42.
Discussion—Fifteen Years of Steel Mill Illumination—What Change. 1927—438.
Discussion—Gas Producers. 1929-30—156.
Discussion—General Crane. 1929-30—340.
Discussion—General Ideas and—By Philadelphia District Membership, A. I. & S. E. E. 1927—457.
Discussion—General Safety—By Membership. 1914—625.
Discussion—Grounded Neutral. 1928-29—114.
Discussion—Hydraulic vs. Electric Drive for Steel Mill Auxiliaries. 1919—703.
Discussion in Connection with Heating Furnaces—By A. F. Mitchell. 1924—571.
Discussion of Paper on Steel Works Illumination—By B. R. Shover. 1911—198.
Discussion of Present Day Wire Rope Problems—By J. F. Howe. 1925—168.
Discussion of the Elements Entering Into the Cost of Producing Power—By W. B. Skinkle. 1928-29—220.
Discussion on Fuel Savings Conference—By W. C. Buell, Jr. 1924—867.
Discussion on Refractories for Use in Steel Plants—By M. C. Booze. 1926—171.
Discussion—Present Practices in Connection with Motor Driven Rollers—By Membership. 1928-20—339.
Discussion—Questionnaire Covering the Organization, Maintenance, Operation of an Electrical Department in a Modern Steel Mill—By Membership. 1929-30—90.
Discussion—Recent Boiler Plant Installation at Edgar Thomson Works, Carnegie Steel Company. 1927—453.
Discussion—Recent Developments in Ball and Roller Bearing Applications—Topical—By Membership, A. I. & S. E. E. 1927—9.
Discussion—Recording and Controlling Instruments in the Iron and Steel Industry—By Membership. 1928-29—349.
Discussion—Report of Electric Heat Committee of A. I. & S. E. E. 1927—376.
Discussion—Report of Electric Welding Committee, A. I. & S. E E.—By Membership. 1929-30—89.
Discussion Report of Electrical Development Committee, A. I. & S. E. E., 1928-29—By Membership. 1929-30—92.
Discussion—Report of the A. I. & S. E. E., Special Committee on Bearings and Special Study Regarding Lubrication of Anti-Friction Bearings on Mill and Crane Motors—By Membership. 1929-30—75.
Discussion—Report of the Electric Tool Committee of A. I & S. E. E.—1928-29—By Membership. 1929-30—97.
Discussion—Report of the Gas Utilization Committee. 1929-30—158.
Discussion—Selecting Electrical Equipment. 1929-30—161.
Discussion—Some Methods of Best Utilizing Electrification in the Steel Industry. 1929-30—159.
Discussion—Some Results of Boiler Water Conditioning. 1929-30—150.
Discussion—Special Bearings Committee Report of A. I. & S. E. E. 1927—383.
Discussion—Steam Connection to Damper Regulators—By J. J. Neville. 1927—486.
Discussion—Steam Generation and Utilization—By Membership. 1929-30—150.
Discussion—Steam vs. Electric Driven Mills—By Membership, A. I. & S. E. E. 1920—35.
Discussion—Stokers and Their Recent Developments—Topical. 1922—163.
Discussion—Surveys of Lighting and Voltage in the Steel Industry—By Membership. 1929-30—60.
Discussion—Symposium-Anti-Friction Bearings for Electric Motors, Auxiliaries and Roll Necks—By Membership. 1928-29—355.
Discussion—Systematizing the Work of an Electrical Engineering Division. 1923—785.
Discussion—The Application of Pulverized Coal to Metallurgical Furnaces—By Membership. 1929-30—94.
Discussion—The Combustion of Liquid Fuel—By Membership. 1929-30—147.
Discussion—The Flat Suspended Open Hearth Roof. 1927—414.
Discussion—The Incorporation of Safety in Electric Station Design—By Membership. 1929-30—144.
Discussion—The Insulation of Open Hearth Furnace Regenerators—By Membership. 1928-29—350.
Discussion—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—By Membership. 1929-30—91.
Discussion—Time Current Control for D. C. Motors—By Membership. 1929-30—96.
Distributing System and Equipment of the National Tube Co., Gary, Indiana—Electrical—By Edwin L. Upp. 1928-29—55.
Distribution in the Steel Industry—Electrical Power—By B. T. Beitman. 1922—793.
Distribution Lines—Lightning Arrester Protection on 13,200 V. and 2,400 V.—By A. R. Wood. 1926—25.
Distribution of Power in Industrial Plants—Transmission and—By D. M. Petty. 1920—309.
Distribution Systems—Grounding the Neutral for D. C.—By W. H. Price. 1919—305.
Distribution Systems—Underground—By G. J. Newton. 1916—171.
Distribution—Underground System of—By W. D. Legon. 1912—297.
Division—Systematizing the Work of an Electrical Engineering—By P. T. Vanderwaart. 1923—553.
Door Hoist for Open Hearth Furnaces—Automatic—By W. H. Burr and H. A. Lewis. 1918—209.
Drilling and Reaming—Electric—By F. W. Stevens. 1908 Paper 2.
Drive for Main Rolls—Questions on Motor—By E. Friedlaender. 1913—209.

Drive for Main Rolls of Steel Mills—Present Status of Motor—By Brent Wiley. 1913—171.
Drive for Planers—Direct Connected Reversing Motor—By G. W. Richardson. 1911—43.
Drive for Reversing Blooming Mill—Engine vs. Motor—By C. H. Hunt. 1924—547.
Drive for Steel Mill Auxiliaries—Hydraulic vs. Electric—By R. B. Gerhardt. 1919—85.
Drive—General Specifications for A. C. Motors for Main Roll—By Standardization Committee—T. E. Tynes, Ch. 1919—569.
Drive—Improved Rolling Mill Practice Obtained by the Use of Direct Current Motors for Main Roll—By G. E. Stoltz. 1922—849.
Drive—in Steel Mills—Economics of Electric—By Wilfred Sykes. 1914—597.
Drive Motors for Strip and Skelp Mills—Selection of Main—By A. F. Kenyon. 1928-29—190.
Drive—Report on Operation of Stoeckel Induction—By G. H. Winslow. 1908—Paper 1.
Drive—Specification for 40" Reversing Blooming Mill. 1928-29—404.
Drive—Speed Control of Induction Motors for Steel Mill—By J. D. Wright. 1916—693.
Drive Statistics—1929 Main Roll. 1929-30—197.
Drive—The Control of Induction Motors for Rolling Mill By Wilfred Sykes and G. E. Stoltz. 1914—357.
Drive—The Induction—By A. P. Stoeckel. 1908—Paper 4.
Driven Accumulator Pumps—Motor—By J. R. Penman. 1923—44.
Driven Auxiliary Apparatus in Steel Mills—Control of Motor—By H. D. James. 1908—Paper 5.
Driven Bloom Shear Without Clutch—Motor—By D. W. Dean. 1926—227.
Driven Continuous Mills—Practical Operation of Motor—By H. C. Cronk. 1918—35.
Driven Generators—Gas Engine—By B. A. Behrend. 1907 Paper—18.
Driven Mills—Discussion Steam vs. Electric—By Membership, A. I. & S. E. E. 1920—35.
Driven Mills—Electrically—By J. T. Sturtevant. 1918—429.
Driven Plate Mill—120" Motor—By W. C. Kennedy. 1923 39.
Driven Plate Mills—Electrically—By G. E. Stoltz. 1918—575
Driven Reversing Mills—Electrically—By J. D. Wright, R. W. Davis and O. H. Needham. 1924—513.
Driven Reversing Mills—Electrically—By Wilfred Sykes. 1914—667.
Driven—Rollers—Present Practices in Connection with Motor—By J. C. Dobelbower. 1928-29—177.
Drives—A. C. vs. D. C. Motors for Rolling Mill Table—By W. S. Hall. 1919—419.
Drives—Adjustable Speed Main Roll—By M. H. Morgan. 1928-29—362.
Drives—Adjustable Speed Motor—By R. W. Davis. 1923—645.
Drives—Auxiliary—By Gordon Fox. 1919—123.
Drives—Considerations Concerning Auxiliary—By Gordon Fox. 1920—343.
Drives—Electric Mill—By J. D. Wright. 1920—1.
Drives—Factors Involved in the Selection of Direct Connected and Geared Main Roll—By E. A. Hurme. 1925—49.
Drives—Flexible Couplings for Steel Mill and Other—By J. J. Serrell. 1923—177.
Drives for Main Rolls of Steel Mills—Variable Speed—By K. A. Pauly. 1913—267.
Drives for Power Plant Auxiliaries—By F. T. Leilich, 1927—115.
Drives for Reversing Mills—Selection of Electric—By L. A. Umansky. 1925—327.
Drives for Reversing Rolling Mills—Electric—By D. M. Petty. 1917—361.
Drives for Rolling Mills—Adjustable Speed—By L. A. Umansky. 1924—817.
Drives for Rolling Mills—Electrical—By H. C. Uhl. 1925—182.
Drives for Steam Electric Generating Stations—Auxiliaries and Auxiliary—By A. L. Penniman, Jr., and F. W. Quarles—1925—255.
Drives for Steel Plants—Electrical—By A. F. Kenyon, 1929-30—189.
Drives—General Specifications of A. C. Motors for Main Roll—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Ch. 1921—479.
Drives in Continental Europe—Observations on Rolling Mill—By O. Needham. 1925—187.
Drives—Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in Auxiliary Steel Mill—By J. E. Fries. 1919—671.
Drives in the United States and Canada—Main Roll. 1929-30—198.
Drives—In the United States and Canada—Classified List of Rolling Mill, Alternating Current Speed Sets. 1929-30—238. Aluminum, Copper, Brass and Non-Ferrous Mill, 1929-30—229. Bar and Billet Mill, 1929-30—231. Blooming Mill, 1929-30—217. Cold Roll, 1929-30—233. Direct Current Adjustable Speed, 1929-30—239. Merchant Mill, 1929-30—225. Multi-Speeed, 1929-30—235. Piercing Mill, 1929-30—220. Plate Mill, 1929-30—217. Rail and Structural Mill, 1929-30—216. Reversing Mill, 1929-30—237. Rod Mill, 1929-30—220. Sheet and Tin Plate, 1929-30—218. Sheet Bar and Skelp Mill, 1919-30—234. Strip and Hoop Mill, 1929-30—222. Synchronous Motors, 1929-30—235. Tube Rolling Mill, 1929-30—221. Wheel Mills, 1929-30—228. Wire Mills, 1929-30—228.
Drives—Modern Reversing Mill—By R. H. Wright. 1929-30—374.
Drives—Motors and Controllers—Machine Tool—By H. W. Tice. 1919—1.
Drives of Merchant, Bar and Rod Mills—Selection of Motors for Main—By C. B. Huston. 1928-29—160.
Drives—Speed Regulation of the Main Roll—By L. A. Umansky. 1927—103.
Drives—The Application of Direct Current Motors to Main Roll—By H. A. Winne. 1927—95.
Drives to Rolling Mills in 1929—Application of Electric—By J. D. Wright. 1929-30—192.
Drives 10" inch Merchant Mill at McKinney Steel Co.—Main—By A. F. Kenyon. 1927—455.
Drives—1928—Developments in Steel Mill—By J. D. Wright. 1928-29—465.
Dry Quenching of Coke—By Walter Sennhauser. 1928-29—118.
Dry Quenching Practice—Coke—By W. E. Bisler. 1928-29—696.
Ductless Electric Power Cables—By C. F. Hood. 1927—45.
Due to Increased Service Capacity—Increased Requirements of Switching Equipment—By W. H. Andrew. 1928-29—441.
Dust and Blast Furnace Control—Blast Furnace Flue—By E. Kieft. 1927—241.
Dynamic Braking—By R. B. Davenport. 1912—401.
Dynamic Braking and Regenerative Braking—Grab Bucket Coal Hoists Operated by Alternating Current Motors With—By James Farrington and R. H. McClain. 1917—439.
Dynamic Braking Lowering—Recent Developments in—By D. C. Wright. 1929-30—263.
Dynamic vs. Mechanical Braking—By G. W. Richardson. 1921—265.
Dynamo—Electric Machinery—Effect of Temperature on the Insulation of—By C. E. Skinner. 1912—287.

E

Economical Combustion—By W. P. Chandler, Jr. 1929-30—545.
Economical Generation and Use of Electric Power in the Steel Industry—Factors Relating to the—By Brent Wiley. 1917—311.
Economical Generation of Electrical Power—The—By A. B. Clark. 1921—601.
Economical Use of Fuel in the Steel Plant—By H. C. Seibert. 1923—661.
Economic and Social Development of the American Iron and Steel Industry—The—By T. W. Robinson. 1927—477.
Economic Considerations in Design of Power Plants for Steel Mills—By T. E. Keating. 1920—455.
Economic Relations—Prime Movers for Central Stations—Their—By Edwin D. Dreyfus. 1911—138.
Economic Value of Safety Work—By L. H. Burnett. 1928-29—134.
Economics and Economies—Engineers. By F. F. Foss. 1929-30—406.

Economics of Combustion—By J. B. Crane. 1929-30—361.
Economics of Electric Drive in Steel Mills—By Wilfred Sykes. 1914—597.
Economies—Engineers, Economics and—By F. F. Foss. 1929-30—406.
Economies of Steel Plant Railroad Electrification—By O. Needham and D. C. Hershberger. 1926—149.
Economizers—By W. F. Keenan, Jr. 1928-29—669.
Economy By Co-operation in Establishing a Better Practice in the Operation of Stokers and Boilers—Fuel—By J. G. Worker. 1917—465.
Economy—Efficiency vs.—By H. G. Ebdon. 1928-29—629.
Economy—Future Thoughts in Fuel—By J. D. Donovan. 1929-30—408.
Economy in Power Service—Conservative—By D. M. Petty. 1928-29—146.
Economy of Fuel and of Time—The Influence of Cheap Oxygen on—By E. A. W. Jefferies. 1921—329.
Economy—Power—By R. M. Fuller. 1929-30—109.
Edgar Thomson Works of the Carnegie Steel Co.—History of the—By L. C. Edgar. 1928-29—116.
Edgar Thomson Works, Carnegie Steel Company—Recent Boiler Plant Installation at—By R. D. Abbiss. 1927—191.
Educational Committee, A. I. & S. E. E., C. A. Menk, Ch., Apprentice Systems. 1916—615.
Educational Committee, A. I. S. E. E., Methods of Education for Electrical Employees of Iron and Steel Mills 1918—303.
Educational Committee, A. I. S. E. E.—Report of—By A B. Holcomb, Ch. 1919—327.
Educational Training for Electrical Employees—By B. A. Cornwell. 1919—378.
Educational Committee for 1921—Report of—By L. F. Galbraith, Ch. 1921—509.
Educational Work in the Iron and Steel Industry—Apprenticeship and—By A. W. Soderberg. 1915—371.
Education and Safety in the Iron and Steel Industry—By L. H. Burnett. 1928-29—262.
Education for Electrical Employees of Iron and Steel Mills—Methods of—By Educational Committee, A. I. S. E. E., 1918—303.
Education of Steel Mill Electricians to Increase Production—Practical—By Educational Committee, B. A. Cornwell, Ch. 1920—255.
Effect of Grounded Neutral on the Efficiency of Lightning Protection Equipment—By K. B. McEachron. 1928-29—95.
Effect of Grounding on the Reliability of Relay Operation—By E. A. Hester and B. M. Jones. 1928-29—102.
Effect of Grounding on Telephone Interference—By J. J. Pilliod. 1928-29—82.
Effect of Temperature on the Insulation of Dynamo-Electric Machinery—By C. E. Skinner. 1912—287.
Effect of Transient Phenomena on the Design and Selection of Alternating Current Equipment—By E. G. Merrick. 1928-29—263.
Effect Upon the Foundry's Future—Electrification and Simplification—Their—By L. W. Egan. 1926-191.
Effecting Savings in the Iron and Steel Industry—How Electric Industrial Truck and Tractor Equipment is—By H. J. Payne. 1926—162.
Effecting Their Performance—Requirements of Lightning Arresters and Factors—By E. D. Tanzer. 1926—29.
Effects of Steel Mill Electrification—Indirect—By S. S. Wales. 1927—132.
Effective Power and Reactive Power—Power Factor Correction—By W. H. Feldmann. 1927—389.
Efficiency—By R. B. Gerhardt. 1928-29—602.
Efficiency of Alternating vs. Direct Current Motors for Steel Mill Auxiliaries—Cost and—By B. R. Shover and Edward J. Cheney. 1911—90.
Efficiency of Electric Power Supply—Improvement in—By C. P. Steinmetz. 1922—691.
Efficiency of Insulation of 220 and 440 Volt Apparatus—Relative—By C. E. Skinner. 1907—Paper 17.
Efficiency of Lightning Protection Equipment—The Effect of Grounded Neutral on the—By K. B. McEachron. 1928-29—95.
Efficiency vs. Economy—By H. G. Ebdon. 1928-29—629.
Efficient Burning of Fuel and Use of Waste Gases in Iron and Steel Plants—By W. W. Pettibone. 1922—49.
Efficient Service Departments to the General Manager—The Value of—By C. S. Proudfoot. 1928-29—601.
Electric Annealing and Heat Treating Furnaces—By G P. Mills. 1921—1.
Electric Annealing Furnace—The—By James Kniveton 1920-30—305.
Electric Apparatus—New Developments in—By K. A. Pauly. 1909—Paper 7.
Electric Arc-Cutting and Welding—By C. J. Holslag. 1919—618.
Electric Arc Furnace—Mechanical and Electrical Operation of the Heroult—By G. W. Richardson. 1916—399.
Electric Arc Welding—By H. L. Unland. 1918—239.
Electric Arc Welding in the Steel Industry—By W. L. Warner. 1925—1.
Electric Arc Welding—The Present Status of—By A. M. Candy. 1919—627.
Electric Crane Wire Diagram—By G. W. Richardson, 1923—36.
Electric Cranes—By F. H. Woodhull. 1923—41.
Electric Cranes for Steel Mills—Manufactured by the Alliance Machine Company—Latest Developments of—By E. H. Kendall. 1915—281.
Electric Cranes—Rules for Safe Operation of—By Safety Committee, A. I. & S. E. E. 1918—273.
Electric Cranes—Worm Gearing for—G. W. Richardson. 1925—87.
Electric Drilling and Reaming—By F. W. Stevens. 1908—Paper 2.
Electric Drive for Steel Mill Auxiliaries—Hydraulic vs.—By R. B. Gerhardt. 1919—85.
Electric Drive in Steel Mills—Economics of—By Wilfred Sykes. 1914—597.
Electric Driven Mills—Discussion Steam vs.—By Membership, A. I. & S. E. E. 1920—35.
Electric Drives for Reversing Mills—Selection of—By L. A. Umansky. 1925—327.
Electric Drives for Reversing Rolling Mills—By D. M. Petty. 1917—361.
Electric Drives to Rolling Mills in 1929—Application of—By J. D. Wright. 1929-30—192.
Electric Furnace Committee for 1920—Report of the—By E. T. Moore, Ch. 1920—497.
Electric Furnace Committee for 1924—Report of—By G. H. Schaeffer, Ch. 1924—731.
Electric Furnace Committee Report—1921—By E. T. Moore, Ch. 1921—587.
Electric Furnace for Annealing Treatment and Forging of Steel—By Wirt S. Scott. 1918—193.
Electric Furnace from the Electrical Standpoint—The—By G. H. Schaeffer. 1918—623.
Electric Furnace Installations—By R. S. Sawdey. 1923—725.
Electric Furnace Phenomena—By E. T. Moore. 1923—569.
Electric Furnace—Progress in the Iron and Steel Industry and the—By Carl G. Frank. 1915—105.
Electric Furnace Steel Processes—The Metallurgy of—By L. B. Lindemuth. 1918—609.
Electric Furnace—The Central Station and the—By W. H. Cogswell. 1916—45.
Electric Furnace—The Melting of Alloys in the—By R. S. Wile. 1915—393.
Electric Furnaces—By J. D. Donovan—1917—671.
Electric Furnaces—By J. A. Seede, 1909—Paper 8.
Electric Furnaces—By G. H. Schaeffer and L. B. Lindemuth. 1918—609.
Electric Furnaces—Heroult—By W. C. Kennedy. 1917—287.
Electric Furnaces in Manufacturing—By N. R. Stansel. 1926—311.
Electric Furnaces in the Steel Industry—Present Status of—By Electric Furnace Committee, R. D. Nye, Ch. 1919—481.
Electric Furnaces—Notes on the Present Status of—By Wilfred Sykes. 1913—283.
Electric Furnace—The Production of Steel and Iron in the—By E. W. Yearsley. 1909—Paper 1.
Electric Galvanizing—By R. M. Cherry. 1929-30—299.
Electric Generating Stations—Auxiliaries and Auxiliary Drives for Steam—By A. L. Penniman, Jr., and F. W. Quarles. 1925—255.
Electric Heat—By Roger H. Bryant. 1929-30—413.
Electric Heat Committee for 1926, A. I. & S. E. E.—By W. P. Chandler, Jr., Ch. 1926—99.
Electric Heat Committee for 1925—Report of—By G. H. Schaeffer, Ch. 1925—228.

Electric Heat in the Iron and Steel Industry—By R. E. Talley. 1926—14.
Electric Heat Committee Report—A. I. & S. E. E.—By G. H. Schaeffer, Ch. 1927—187.
Electric Heat Report Committee, A. I. & S. E. E. 1929-30. By G. H. Schaeffer, Ch. 1929-30—67.
Electric Heat—Report of the Committee on—A. I. & S. E. E.—By G. H. Schaeffer. 1928-29—233.
Electric Heat Treating Furnace Applications—By E. A. Hurme. 1925—229.
Electric Heat Treating Furnace Operating Data—By R. W. Heller. 1927—136.
Electric Heat Treatment—By C. A. Winder. 1919—507.
Electric Heat Treatment—The Tangible Advantages of—By Wirt S. Scott. 1929-30—289.
Electric Heating Applied to the Steel Industry—By F. A. Hansen. 1922—837.
Electric Heating Conference—A. I. & S. E. E. and Pennsylvania State College. 1929-30—281.
Electric Heating of Finishing Rolls of Sheet and Tin Mills—By Gordon Fox. 1923—253.
Electric Heating With Special Reference to Central Stations—By E. D. Sibley. 1924—799.
Electric Industrial Furnaces and Their Application to Leveling Up Load Curves—Essentials of Design of—By G. P. Mils. 1925—11.
Electric Industrial Locomotives—By F. E. Fisher. 1924—913.
Electric Industrial Truck and Tractor Equipment is Effecting Savings in the Iron and Steel Industry—How—By H. J. Payne. 1926—162.
Electric Iron and Steel Furnace Practice During 1927—Review of—By W. E. Lewis. 1928-29—5.
Electric Locomotive for Hot Mill Service—By David J. Munro. 1927—236.
Electric Locomotives for Industrial Purposes—By Walter Fixter and Kenneth Andrew. 1919—283.
Electric Machines—Winding of—By H. G. Specht. 1912—269.
Electric Machinery—Effect of Temperature on the Insulation of Dynamo—By C. E. Skinner. 1912—287.
Electric Maintenance Shop Practice—Developments in—By A. C. Cummins. 1924—579.
Electric Melting Furnaces—By J. A. Seede. 1924—735.
Electric Melting Furnaces—By J. A. Seede. 1925—240.
Electric Melting of Alloy Steels—By H. M. German. 1928-29—435.
Electric Mill Drives—By J. D. Wright. 1920—1.
Electric Mining Equipment, Its Selection, Care and Operation—By A. F. Elliott. 1924—871.
Electric Motors—Anti-Friction Bearings for—By J. S. Murray. 1928-29—185.
Electric Motors for Heavy Torque and Rapid Reversals—By G. W. Richardson. 1908—Paper 3.
Electric Motors—Maintenance of—By N. L. Rea. 1926—288.
Electric Motors—Mounting and Maintenance of Roller Bearings in—By U. B. Wachtler. 1924—207.
Electric Motors—Mounting and Maintenance of Roller Bearings on—By D. E. Batesole. 1924—155.
Electric Motors—The Auxiliary Control and Automatic Acceleration of—By E. W. Yearsley. 1907—Paper 1.
Electric Overhead Traveling Crane—Questionnaire and Answers—A. I. & S. E. E. Special Committee. 1929-30—331.
Electric Overhead Traveling Crane Specifications—A. I. & S. E. E. 1929-30—520.
Electric Overhead Traveling Cranes—A. I. & S. E. E. Recommendations Covering Rules for the Safe Operation of. 1926—89.
Electric Overhead Traveling Cranes, Heavy Duty Steel Mill Service—General Specifications for—By the Crane Standardization Committee of 1921—F. W. Cramer, Chairman. 1921—403.
Electric Overhead Traveling Cranes—Safe Operation of—By Membership. 1926—56.
Electric Power Cables—Ductless—By C. F. Hood. 1927—45.
Electric Power for Steel Mills—Some Important Phases of—By Charles F. Scott. 1909—Paper 3.
Electric Power in the Iron and Steel Industry—Generation of Purchased?—By Gordon Fox. 1927—134.
Electric Power in the Iron and Steel Industry—The Application of—By W. S. Hall. 1922—127.
Electric Power in the Steel Industry—Factors Relating to the Economical Generation and Use of—By Brent Wiley. 1917—311.
Electric Power—Protection and Control of Industrial—By C. P. Steinmetz. 1915—15.
Electric Power Supply—Improvement in Efficiency of—By C. P. Steinmetz. 1922—691.
Electric Precipitator—On the Mathematical Theory of the Cottrell—By A. W. Simon. 1928-29—535.
Electric Repair Shop Practices of the Pittsburgh Railways Company—By L. J. King. 1925—355.
Electric Reversing Blooming Mill—Operating Characteristics of an—By E. S. Jefferies. 1916—309.
Electric Reversing Mill Considered from the Standpoint of Tonnage—The—By K. A. Pauly. 1920—415.
Electric Salt Bath Furnace for Heat Treating—By A. E. Bellis. 1929-30—311.
Electric Skip Hoists and Bell Hoists—By H. D. James and F. J. Burd. 1917—17.
Electric Skip Hoists and Bell Hoists for Blast Furnaces—Recent Developments—of—By D. L. Lindquist. 1918—43.
Electric Station Design—The Incorporation of Safety in—By V. R. Bacon. 1928-29—615.
Electric Tools as Applied to the Iron and Steel Industry, Portable—By A. M. Andresen, 1916—447.
Electric Tools in the Steel Industry: Ground them for Safe Operation—Portable—By W. M. Runyon. 1928-29—692.
Electric Transportation—By F. O. Schnure. 1923—335.
Electric Utilities—The Steel Industry and the—By Merrill Skinner and F. D. Mahoney. 1924—651.
Electric Welding Committee—Report—By S. S. Wales. 1928-29—690.
Electric Welding Machines—By Frank Warren. 1912—140.
Electric Welding of Heavy Materials—By J. F. Lincoln. 1929-30—296.
Electrical Analysis of 40-Inch Blooming Mill Screwdown—Mechanical and—By F. D. Egan. 1924—487.
Electrical Apparatus—Factory Testing—A. I. & S. E. E. Junior Division. 1928-29—446.
Electrical Apparatus for Cranes and Machine Tools—Standardization of—By H. Cosden. 1917—663.
Electrical Apparatus—Inspection and Operation of—By J. A. Morgan and J. J. Booth. 1919—369.
Electrical Apparatus—Repair and Depreciation of—By G. E. Stoltz. 1915—341.
Electrical Application in the Iron and Steel Industry in the United States—Statistical—Data of—By R. Tschentscher. 1914—83.
Electrical Applications in Steel Mill Practice—Some—By D. M. Petty. 1915—233.
Electrical Applications in the Steel Mill Industry—Recent—By G. E. Stoltz. 1917—135.
Electrical Arc Welding Apparatus—Some Practical and Theoretical Considerations in the Design of—By Robert E. Kinkead. 1919—614.
Electrical Bright Annealing Furnace—Experiences with—By A. Pomp. 1927—377.
Electrical Bright Annealing Furnace—Tests with—By E. Schreiber. 1927—379.
Electrical Department—Bethlehem Steel Co., Lackawanna Plant—Switching Instructions. 1928-29—34.
Electrical Department in the Iron and Steel Industry—Organization of the—By Membership, A. I. & S. E. E. 1919—368.
Electrical Development at the Lackawanna Plant of the Bethlehem Steel Company—The—By F. D. Egan and J. F. Oehler. 1929-30—419.
Electrical Development Committee Report 1921—By R. B. Gerhardt, Ch., 1921—497.
Electrical Development Committee, Report for 1928-29, A. I. & S. E. E.—By W. H. Burr, 1928-29—605.
Electrical Developments Committee A. I. &. S. E. E., 1929-30, Report of—By W. H. Burr, Ch., 1929-30—451.
Electrical Developments Committee, A. I. & S. E. E., W. T. Snyder, Ch.—Latest Developments in New Apparatus and Appliances, 1916—533.
Electrical Developments Committee of A. I. & S. E. E. for 1923, Report of—By W. C. Kennedy, Ch., 1923—523.

Electrical Developments Committee, A. I. & S. E. E., Yearly Report—By W. H. Burr, Chairman, 1928-29—153.
Electrical Developments Committee of A. I. & S. E. E., Report of—By W. H. Burr, Ch., 1927—203.
Electrical Developments Committee Report, 1920—By E. S. Jeffries Ch., 1920—381.
Electrical Developments Committee Report for 1922, A. I. & S. E. E.—By R. B. Gerhardt Ch., 1922—605.
Electrical Developments During the Year 1927—By Walter Burr, 1928-29—15.
Electrical Distributing System and Equipment of the National Tube Co., Gary, Indiana—By Edwin L. Upp, 1928-29—55.
Electrical Drives for Rolling Mills—By H. C. Uhl, 1925—182.
Electrical Drives for Steel Plants—By A. F. Kenyon, 1929-30—189.
Electrical Employees, Educational Training for—By B. A. Cornwell, 1919—378.
Electrical Employees of Iron and Steel Mills—Methods of Education for—By Educational Committee, A. I. & S. E. E., 1918—303.
Electrical Engineer and the Safety Engineer can be Mutually Helpful, How the—By J. A. Oartel, 1925—220.
Electrical Engineer in the Steel Industry Today, The—By A. J. Standing, 1926—XII.
Electrical Engineer In the Steel Plant and Out, The—By F. B. Crosby, 1921—563.
Electrical Engineering at Lehigh University—By J. W. Barker, 1929-30—391.
Electrical Engineering Division, Systematizing the Work of an—By P. T. Vanderwaart, 1923—553.
Electrical Equipment and Its Relation to Accident Hazard, Standardization of—By W. Greenwood, 1920—297.
Electrical Equipment for Arc Furnaces Used in the Melting and Refining of Ferrous Metals, Selection of—By Samuel Arnold III, 1928-29—487.
Electrical Equipment in Rolling Mills—By Brent Wiley, 1908—Paper 7.
Electrical Equipment, Safeguarding—By Walter Greenwood, 1917—253.
Electrical Equipment,Safety Rules for Government of Employees Working on—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Ch., 1919—315.
Electrical Equipment, Selecting—By L. A. Umansky, 1928-29—633.
Electrical Equipment, Some of the Latest Developments in —By K. A. Pauly, 1915—81.
Electrical Equipment to Comply with Requirements of Safety, Installation of—By W. Greenwood, 1915—299.
Electrical Features of a Modern Steel Plant—By R. B. Gerhardt, 1920—77.
Electrical Features of Hog Island Shipyard, The—By H. W. Osgood, 1919—33.
Electrical Hazards in the Steel Industry—By F. W. Cramer, 1926—290.
Electrical Installations at the Aliquippa Plant of the Jones & Laughlin Steel Corp.—By R. M. Hussey, 1927—448.
Electrical Installations at the Cambria Plant of the Bethlehem Steel Co., Features of the New—By F. W. Cramer, 1926—278.
Electrical Installations Brier Hill Sheet Mill, Youngstown Sheet & Tube Co.—By E. F. Rhodes, 1925—84.
Electrical Installations, Guarding Against the Invisible Hazards of—By W. Greenwood, 1926—224.
Electrical Installations, Structural Mills Homestead Works, Carnegie Steel Co., Munhall, Pa.—By C. A. Menk, 1927—214.
Electrical Machinery and the Insulation Problem, Steel Mill —By C. E. Skinner, 1924—101.
Electrical Men, Mechanically Trained—By W. S. Hall, 1925—VI.
Electrical Operation of the Heroult Electric Arc Furnace, Mechanical and—By G. W. Richardson, 1916—399.
Electrical Power Distribution in the Steel Industry—By B. T. Beitman, 1922—793.
Electrical Power, The Economical Generation of—By A. B. Clark, 1921—601.
Electrical Power; Using Waste Heat, Generation of—By F. O. Schnure, 1925—296.
Electrical Problems Practically Considered, Some—By B. G. Lamme, 1914—13.
Electrical Progress in Steel Plants—By A. L. Reichert, 1928-29—145.
Electrical Repair Shop—By C. A. Menk, 1919—381.
Electrical Repair Shop Practice, Steel Mill—By A. J. Standing, 1920—109.
Electrical Resistance Materials—By Walter Kennedy, 1921—241.
Electrical Reversing Blooming Mills—By Ralph D. Nye, 1917—351.
Electrical Rolling Mills—By D. W. Blakeslee, 1925—323.
Electrical Safety Circuits, Their Uses and Construction—W. M. Runyon, 1927—248.
Electrical Standpoint, The Electric Furnace from the—By G. H. Schaeffer, 1918—623.
Electrical Superintendent, The—By R. M. Hussey, 1928-29—639.
Electrical Systems, Interconnections of—By N. E. Funk, 1929-30—390.
Electrical Work, The Relation of Physical Examination to —By S. C. Coey, 1915—379.
Electrically Driven Mills—By J. T. Sturtevant, 1918—429.
Electrically Driven Plate Mills—By G. E. Stoltz, 1918—575.
Electrically Driven Reversing Mills—By Wilfred Sykes, 1914—667.
Electrically Driven Reversing Mills—By J. D. Wright, R. W. Davis and O. H. Needham, 1924—513.
Electrically Heated Hot Top Ingots—By F. C. Watson, 1926—1.
Electrically Heated Soaking Pits—By B. G. Bailey, 1925—367.
Electrically, Measuring Gas—By J. C. Wilson, 1918—115.
Electrically Operated Central Pumping Station, An—By F. W. McKee, 1911—125.
Electrically Operated Crane Statistics, 1929—1929-30—196.
Electricians to Increase Production, Practical Education of Steel Mill—By Educational Committee, B. A. Cornwell, Ch., 1920—255.
Electricity and Lightning Protection, Natural—By J. Slepian, 1926—32.
Electricity a Factor in Reduced Rolling Costs—By C. M. Thompson, Jr., 1929-30—112.
Electricity Applied to the Mechanical Mining of Coal—By C. B. Reed, 1919—179.
Electricity as Applied to Industrial Plants, The Measurement of—By H. H. Pratt, 1925—349.
Electricity, Heating of Ingots by—By R. A. Butler, 1925—246.
Electricity in the Development and Manufacture of Tool Steel, Uses of—By O. K. Parmiter, 1929-30—293.
Electricity in the Iron and Steel Industry—By J. C. Reed, 1925—307.
Electricity in the Steel Industry, The Future of—By W. H. Burr, 1925—VIII.
Electricity, Specifications for Welding Steel Buildings by—By Frank P. McKibben, 1929-30—86.
Electricity—The Generation of Steam by—By P. H. Falter, 1923—231.
Electricity to the Manufacture of Steel—Evolution of the Application of—By George J. Walz, 1928-29—151.
Electricity's Contribution to the Iron and Steel Industry, 1929-30—198.
Electrification—By R. S. Sawdey, 1926—XIII.
Electrification and Simplification, Their Effect Upon the Foundries Future—By L. W. Egan, 1926—191.
Electrification, A Review of Steel Mill—By B. G. Lamme and W. Sykes, 1922—583.
Electrification as a Means of Reducing Costs—By G. E. Stoltz, 1928-29—149.
Electrification at the South Works of the American Steel Wire Co., Worcester Mass, Rod Mill—By Roger H. Bryant, 1928-29—429.
Electrification, Economics of Steel Plant Railroad—By O. Needham and D. C. Hershberger, 1926—149.
Electrifications, Foundry—By Phelan McShane, 1927—27.
Electrification, Indirect Effects of Steel Mill—By S. S. Wales, 1927—132.
Electrification in the Manufacturing Industry, Evolution of By F. H. Kittredge, 1929-30—411.
Electrification in the Steel Industry, Some Methods of Best Utilizing—By G. E. Stoltz, 1928-29—651.
Electrification of Industrial Plant Railways—By D. M. Petty, 1922—153.
Electrification of Sheet Mills—By J. S. Murray, 1927—73.
Electrification of Steel Mills and the Use of Central Station Power, The—By Brent Wiley and Wilfred Sykes, 1915—177.
Electrification of the Foundry Industry, The Complete—By L. W. Egan, 1923—377.

Electrification of the International Nickel Company's Works for Monel Metal—By F. C. Watson, 1922—415.
Electrification of the Steel Plant Railroad—By R. B. Gerhardt, 1921—535.
Electrifications of the Steel Plant Railroad Yard, Some Considerations in the—By R. B. Gerhardt, 1922—461.
Electrification of the Tata Iron Works at Jamshedpur—By S. Ghosh, 1927—404.
Electrified Rod Mill, Remodeled and—By S. N. Roberts, 1925—24.
Electrode, The Combustion Flame—By George T. Southgate, 1923—87.
Electrolysis and Modern Cable Construction—By W. W. Walsh, 1919—97.
Electrolytic Oxy-Hydrogen Plant—Automatic—By F. H. Woodhull, 1919—217.
Elements Entering Into the Cost of Producing Power—Discussion of the—By W. B. Skinkle. 1928-29—220.
Elements of Commutation—By Jerry Albrecht, A. I. & S. E. E., Junior Division, 1928-29—494.
Employee in Safety—Instructing the New—By A. C. Germain, 1929-30—180.
Employee in Safety, Instructing the New—By H. G. Hensel 1929-30—180.
Employees, Education Training for Electrical—By B. A. Cornwell, 1919—378.
Employees of Iron and Steel Mills, Method of Education for Electrical—By Educational Committee, A. I. & S. E. E., 1918—303.
Employees Training for Combustion Work—By W. P. E. Ainsworth, 1928-29—484.
Employees Working on Electrical Equipment, Safety Rules for Government of—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Ch., 1919—315.
End Trucks for Cranes, Spring—By John Minty, 1929-30—59.
Engine Driven Generators, Gas—By B. A. Behrend, 1907—Paper 18.
Engine Stops, Automatic—By W. Greenwood, 1918—325.
Engine Stops, Standardization of—By W. Greenwood, 1923—355.
Engine vs. Motor Drive for Reversing Blooming Mill—By C. H. Hunt, 1924—547.
Engine, The Unaflow—By W. Trinks, 1916—139.
Engines for Power Generation in Steel Plants, Internal Combustion—By D. M. Petty, 1922—709.
Engineer and His Relation to National Progress—By M. J. Conway, 1929-30—280.
Engineer and the Safety Engineer can be Mutually Helpful, How the Electrical—By J. A. Oartel, 1925—220.
Engineer as an Executive, Recognition of the—By Wray Dudley, 1928-29—475.
Engineer can be Mutually Helpful, How the Electrical Engineer and the Safety—By J. A. Oartel, 1925—220.
Engineer, Carbon Brush Standardization as Viewed by a Designing—By A. M. MacCutcheon, 1928-29—507.
Engineer in Industry, The—By A. C. Cummins, 1925—V.
Engineer in the Steel Industry Today—The Electrical—By A. J. Standing. 1926—XII.
Engineer In the Steel Plant and Out—The Electrical—By F. B. Crosby. 1921—563.
Engineer, Iron and Steel—A. J. Standing, 1928-29—1.
Engineer, Steel Treating and Its Value to the Steel—By R. F. Crump, 1925—298.
Engineer, The Value of Records to an Operating—By Ray S. Huey, 1916—343.
Engineer to Fuel Conservation, The Relation of the—By J. W. Hays, 1922—395.
Engineers, Economics and Economies—By F. F. Foss, 1929-30—406.
Engineering at Lehigh University, Electrical—By J. W. Barker, 1929-30—391.
Engineering Course, Should Colleges and Universities Create a Safety—By J. A. Voss, 1929-30—446.
Engineering Division, Systematizing the Work of an Electrical—By P. T. Vanderwaart, 1923—553.
Engineering During 1928, Review of Fuel—By M. J. Conway, 1928-29—458.
Engineering in the Steel Industry—By W. H. Warren, 1928-29—604.
Engineering Investigation in Operating Cost Reduction—By W. W. Garrett, 1927—136.
Engineering Practice, Condensers and Condenser—By D. D. Pendleton, 1918—385.
Entering Into the Cost of Producing Power—Discussion of the Elements—By W. B. Skinkle. 1928-29—220.
Entering Into the Selection of Motors for Mine Hoists—Some Factors—By F. W. Cramer and A. A. McDonald. 1923—672.
Equipment, Air Conditioning—By W. H. Burr, 1928-29—275.
Equipment and Its Relation to Accident Hazard, Standardization of Electrical—By W. Greenwood, 1920—297.
Equipment, Automatic Control of Reversing Rolling Mill—By E. S. Lammers, Jr., 1920—137.
Equipment, Centrifugal Pumps with Automatic—By N. C. Bye, 1928-29—279.
Equipment Due to Increased Service Capacity, Increased Requirements of Switching—By W. H. Andrew, 1928-29—441.
Equipment, Effect of Transient Phenomena on the Design and Selection of Alternating Current—By E. G. Merrick, 1928-29—263.
Equipment Etc., Improving Non-Condensing Power Plant by Use of Direct Current Mixed Pressure Turbine—By R. F. Patterson, 1915—153.
Equipment for Arc Furnaces Used in the Melting and Refining of Ferrous Metals, Selection of Electrical—By Samuel Arnold, III, 1928-29—487.
Equipment for Induction Motors with Fly Wheels, Automatic Speed Regulating—By E. J. Cheney, 1912—115.
Equipment for Steel Mills and Foundries, Arc Welding—By H. L. Unland, 1919—606.
Equipment in Rolling Mills, Electrical—By Brent Wiley, 1908—Paper 7.
Equipment is Effecting Savings in the Iron and Steel Industry, How Electric Industrial Truck and Tractor—By H. J. Payne, 1926—162.
Equipment, Its Selection, Care and Operation—Electric Mining—By A. F. Elliott, 1924—871.
Equipment of the National Tube Company, Gary Indiana—Electrical Distributing System and—By Edwin L. Upp, 1928-29—55.
Equipment of the Reading Company—The Maintenance of Locomotive and Rolling—By I. A. Seiders, 1927—29.
Equipment—Relation Between Central Stations and Steel Plants in Connection with Protective—By B. M. Jones, 1928-29—52.
Equipment—Replacement of Obsolete—By A. J. Standing, 1927—133.
Equipment—Safeguarding Electrical—By Walter Greenwood, 1917—253.
Equipment—Safety Rules for Government of Employees Working on Electrical—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Ch. 1919—315.
Equipment—Selecting Electrical—By L. A. Umansky, 1928-29—633.
Equipment—Some of the Latest Developments in Electrical—By K. A. Pauly, 1915—81.
Equipment—Tapered Roller Bearings and Their Applicability to Steel Mill—By F. Waldorf, 1929-30—247.
Equipment—The Effect of Grounded Neutral on the Efficiency of Lightning Protection—By K. B. McEachron, 1928-29—95.
Equipment to Comply with Requirements of Safety—Installation of Electrical—By W. Greenwood, 1915—299.
Equipments for Auxiliary Motors, Control—By J. D. Wright, 1921—615.
Equipments—Speed Regulating Induction Motor Synchronous Generator Frequency Changer—By H. C. Uhl, 1926—83.
Essential Factor in Furnace Design—Fuel Application—The—By E. J. Evans, 1925—123.
Essential for Safety—Good Order as an—By J. A. Voss, 1926—242.
Essentials of Design of Electric Industrial Furnaces and Their Application to Leveling Up Load Curves—By G. P. Mills, 1925—11.
Establishing a Better Practice in the Operation of Stokers and Boilers—Fuel Economy by Co-Operation in—By J. G. Worker, 1917—465.
Europe—Fuel Utilization Practiced in—By M. J. Conway, 1928-29—590.
Europe—Observations on Rolling Mill Drives in Continental—By O. Needham, 1925—187.
Evolution of Electrification in the Manufacturing Industry—By F. H. Kittredge, 1929-30—411.
Evolution of the Application of Electricity to the Manufacture of Steel—The—By G. J. Walz, 1928-29—151.

Examination to Electrical Work—The Relation of Physical —By S. C. Coey, 1915—319.
Examples of the Tendency Toward Conservation of Low Grade and Waste Gases—Foreign Practice and Some— J. C. Hayes, 1928-29—695.
Excello Arc Lamps—By A. Cair, 1910—59.
Executive—Recognition of the Engineer as an—By Wray Dudley, 1928-29—475.
Executive—The—By Martin J. Conway, 1928-29—145.
Exclusively Alternating Systems in Steel Mills—First Cost and Operating Expenses of Mixed vs. By Gano Dunn, 1910—65.
Expansions—Year 1929—High Spots in Iron and Steel Plant—1929-30—246.
Expenses of Mixed vs. Exclusively Alternating Systems in Steel Mills—First Cost and Operating—By Gano Dunn, 1910—65.
Experience in the Iron and Steel Industry—Accident— 1928-29—8.
Experience of a Public Utility with Grounded Neutral—By G. S. Humphrey, 1928-29—98.
Experiences in the Steel Industry with Grounded Neutral— By A. C. Cummins, 1928-29—104.
Experiences with Electrical Bright Annealing Furnaces— By A. Pomp, 1927—377.
Explosions—Installation and Operation of Air Compressor Plants for Avoidance of—By W. Greenwood, 1927—126.
Exposition—Our Convention and—By A. J. Standing, 1928-29—143.
Exposition—Twenty-Sixth Annual Convention and Iron and Steel—By F. W. Cramer. 1929-30—403.
Extended Utilization of Blast Furnace Gas—Certain Principles in the—By Owen R. Rice, 1928-29—568.
Extending the Heat Cycle in Boiler Rooms by the Use of Preheated Air for Combustion Purposes—By J. G. Worker, 1925—274.
Extraction in Steel Mill Power Plants—Possibilities in Stage Heating and Steam—By H. T. Watts, 1923—105.

F.

Fabricated Direct Current Machines—By R. S. Marthens and F. T. Hague, 1929-30—117.
Factor in Furnace Design—Fuel Application—The Essential —By E. J. Evans, 1925—123.
Factor in Reduced Rolling Costs—Electricity a—By C. M. Thompson, Jr., 1929-30—112.
Factor in Safety—Physical Conditions of a Steel Mill as a By H. W. Darr, 1982-29—282.
Factors Affecting the Application of Carbon Brushes to Direct Current Machines—By C. W. Lange. 1928-29— 509.
Factors Effecting Their Performance—Requirements of Lightning Arresters and—By E. D. Tanzer, 1926—29.
Factors Entering Into the Selection of Motors for Mine Hoists—By F. W. Cramer and A. A. MacDonald, 1923 —627.
Factors Governing the Design of Roller Bearings for Roll Necks—By F. H. Buhlmann, 1927—208.
Factors Governing the Purchase of Coal—By Morgan B. Smith, 1928-29—172.
Factors Involved in the Selection of Direct Connected and Geared Main Roll Drives—By E. A. Hurme. 1925—49.
Factors Relating to the Economical Generation and Use of Electric Power in the Steel Industry—By Brent Wiley, 1917—311.
Factors Which Influence the Choice of Waste Heat Boilers —By J. B. Crane, 1928-28—343.
Factory Testing of Electrical Apparatus—A. I. & S. E. E., Junior Division, 1928-29—446.
Fairfield Works, Tennessee Coal Iron and Railroad Company, New Blast Furnace Power Plant—By J. M. Sprague, 1928-29—721.
Fans with Synchronous Motors—Reducing Power Bills on Mine—By F. W. Cramer and A. A. MacDonald, 1922 —213.
Favor of the A. B. Lamp as Opposed to Other Makes of Flame Lamps—Points in—By G. Frank Slocum, 1910—28.
Features of a Modern Steel Plant—Electrical—By R. B. Gerhardt, 1920—77.
Features of Basic Open Hearth Construction—Chief—By M. J. Conway, 1929-30—318.
Features of Good Steel Mill Illumination—Some—By Ward Harrison, 1911—198.
Features of Hog Island Shipyard—The Electrical—By H. W. Osgood, 1919—33.
Features of the New Electrical Installations at the Cambria Plant of the Bethlehem Steel Co.—By F. W. Cramer, 1926—278.
Ferrous Metals—Selection of Electrical Equipment for Arc Furnaces Used in the Melting and Refining of—By Samuel Arnold, III, 1928-29—487.
Ferrous Metallurgy—Some Applications of Oxygen to— By F. W. Davis, 1924—427.
Field Coils—Direct Current Motor—By R. B. Treat, 1912 —125.
Field of Combustion—Developments in the—By H. V. Flagg, 1929-30—178.
Fifteen Years of Steel Mill Illumination—What Change?— By Ward Harrison, 1927—143.
Fifty Degree Rise Motors—Continuous Rated or—By L. F. Adams. 1921—21.
Final Outline Dimensions for A. I. & S. E. E. Mill Type Motor—By A. C. Cummins, Ch. Standardization Committee, 1928-29—247.
Finishing Rolls of Sheet and Tin Mills—Electric Heating of—By Gordon Fox, 1923—253.
Fireless Steam Locomotive in Shuttle Service at a Steel Plant—Performance and Costs of Operating—By C. H. Hunt, 1929-30—82.
Firing in Steam Generation—Pulverized—By F. J. Crolius, 1921—161.
First Cost and Operating Expenses of Mixed vs. Exclusively Alternating Systems in Steel Mills—By Gano Dunn, 1910—65.
First—Safety—By John M. Gull, 1929-30—16.
Flame Electrode—The Combustion—By George T. Southgate, 1923—87.
Flame Lamps—Points in Favor of the A. B. Lamp as Opposed to Other Makes—By G. Frank Slocum, 1910 —28.
Flaming Arc Lamp in the Iron and Steel Industry—The— —By A. T. Baldwin, 1914—491.
Flaming Arc Lamps; Their Operation and Demonstration— By C. J. Toerring, 1909—Paper 12.
Flashovers—Protection of High Tension Insulators from— By H. B. Vincent, 1928-29—311.
Flat Suspended Open Hearth Roof—The—By A. L. Foell, 1927—140.
Flexible Couplings—By R. W. Davis, 1923—216.
Flexible Couplings—By P. C. Day, 1923—204.
Flexible Couplings—By Gustave Fast, 1923—188.
Flexible Couplings—By L. H. Keim, 1923—225.
Flexible Couplings—By W. E. Trumpler, 1923—219.
Flexible Couplings for Steel Mill and Other Drives—By J. J. Serrell, 1923—177.
Flexible Couplings—The Mesta—By W. Trinks, 1923—210.
Flexible Coupling—The Thomas—By J. H. Albrecht, 1923 —206.
Flow Measurement in Connection with Coke Oven Gas— By J. M. Spitzglass, 1929-30—381.
Flow Turbines—Mixed—By M. L. Nusim, 1916—601.
Flue Dust and Blast Furnace Control—Blast Furnace—By E. Kieft, 1927—241.
Fluids—Automatically Opening and Closing Receptacles Containing Inflammable—By Walter Greenwood, 1928-29 —444.
Fly Wheels—Automatic Speed Regulating Equipment for Induction Motors with—By E. J. Cheney, 1912—115.
Flywheels for Rolling Mill Applications—By G. E. Stoltz, 1917—721.
Foot Control—By G. J. Walz, 1923—46.
Foreign Practice and Some Examples of the Tendency Toward Conservation of Low Grade and Waste Gases— By J. C. Hayes, 1928-29—695.
Foreign Steel Mill Practice—By W. H. Burr, 1925—178.
Foreign Steel Mill Practice—By F. L. Estep, 1925—179.
Forging of Steel—The Electric Furnace for Annealing Treatment and—By Wirt S. Scott, 1918—193.
Foreman's Responsibility in Safety and Rehabilitation— The Superintendent's and—By J. D. Donovan, 1927—135.
Formation by Boiler Water Conditioning—The Prevention of Scale—By R. E. Hall, Carl Fischer and G. W. Smith, 1924—353.
Forms—A. I. & S. E. E. Steel Mill Auxiliary Control Specification Guide—1929-30—170.
Forms—Specifications and Guide—By J. J. Booth, 1929-30 —179.
Foundry Electrifications—By Phelan McShane, 1927—27.
Foundry Industry—The Complete Electrification of the— By L. W. Egan, 1923—377.

Foundry's Future—Electrification and Simplification—Their Effect Upon the—By L. W. Egan. 1926—191.
Foundries—Arc Welding Equipment for Steel Mills and—By H. L. Unland, 1919—606.
Foundries—The Correction of Unsafe Practices in—By Nelson H. Kyser, 1928-29—409.
Fox Multax Lamps—The—By J. J. Batterman, 1910—61.
Frequency Changer Equipments—Speed Regulating Induction Motor, Synchronous Generator—By H. C. Uhl, 1926—83.
Frequency Changers—The Operation of—By L. M. Smith, 1922—773.
Frequency Converter Speed Sets for the Carnegie Steel Company, Upper Union Works, Youngstown, Ohio—By G. P. Wilson, 1927—487.
Frequency Converters for Interchange of Power Between Steel Mills and Central Stations—By Fred J. Schwartz. 1926—79.
Frequency—Power Generation in the Steel Mills and Its Relation to—By D. M. Petty, 1921—199.
Frequency Problem in the Steel Industry—By B. G. Lamme, 1921—69.
Friendship—Safety Stimulates Industrial—By J. A. Voss, 1928-29—469.
Frog Leg Windings—Direct Current Armature Windings for Multi-Polar Generators and Motors—By W. H. Powell and G. M. Albrecht, 1925—198.
Fuel and of Time—The Influence of Cheap Oxygen on Economy of—By E. A. W. Jefferies. 1921—329.
Fuel and the Use of Waste Gases in Iron and Steel Plants—The Efficient Burning of—By W. W. Pettibone, 1922—49.
Fuel Application—The Essential Factor in Furnace Design—By E. J. Evans, 1925—123.
Fuel Burning and Steam Generation During 1928—Review of Certain Developments in—By Carl Stripe. 1928-29—461.
Fuel Conservation—The Relation of the Engineer to—By J. W. Hays. 1922—395.
Fuel Consumption—Steel Production and—By E. Kieft, 1926—298.
Fuel Economy by Co-Operation in Establishing a Better Practice in the Operation of Stokers and Boilers—By Joseph G. Worker, 1917—465.
Fuel Economy—Future Thoughts in—By J. D. Donovan, 1929-30—408.
Fuel Engineering During 1928—Review of—By M. J. Conway, 1928-29—458.
Fuel for Continuous Normalizing Furnaces—By J. W. Jones, 1928-29—696.
Fuel Gases and Their Use in Iron and Steel Plants—By H. S. Watts. 1922—97.
Fuel in Great Britain—Utilization of—By T. A. Peebles, 1928-29—587.
Fuel in the Steel Plant—Economical Use of—By H. C. Seibert, 1923—661.
Fuel Requirements of Steel Mills—By F. E. Leahy. 1921—341.
Fuel—The Combustion of Liquid—By Robert C. Vroom, 1928-29—640.
Fuel Utilization Practiced in Europe—By M. J. Conway, 1928-29—590.
Fuels—By M. J. Conway, 1929-30—548.
Fuels from Gas Analysis—Judging the Combustion of Gaseous—By A. G. Witting, 1922—499.
Fuels—Gaseous—By Walter Flanagan, 1928-29—467.
Fuels in Steel Mills Comparative Value of—By H. V. Flagg, 1929-30—367.
Full Reverse A.C. Two Speed Mill Controller—By E. G. Peterson, 1926—308.
Fundamental Considerations of Power Factor Correction—Some—By R. A. McCarty, 1918—19.
Furnace Application—Electric Heat Treating—By E. A. Hurme, 1925—229.
Furnace Applications—Medium and Low Temperature—By E. A. Hurme. 1924—771.
Furnace Bindings—By A. R. Tegge, 1928-29—581.
Furnace Committee Report, 1921—Electric—By E. T. Moore, Ch. 1921—587.
Furnace Committee for 1920—Report of the Electric—By E. T. Moore, Ch. 1920—497.
Furnace Committee for 1924—Report of Electric—By G. H. Schaeffer, Ch., 1924—731.
Furnace Control—Blast Furnace Flue Dust and Blast—By E. Kieft, 1927—241.
Furnace Control—The Isley—By G. A. Merkt, 1928-29—556.
Furnace Design—Fuel Application—The Essential Factor in—By E. J. Evans, 1925—123.
Furnace Design—Recent Developments in Industrial—By G. R. McDermott, 1929-30—534.
Furnace Flue Dust and Blast Furnace Control—Blast—By E. Kieft, 1927—241.
Furnace for Annealing Treatment and Forging of Steel—The Electric—By Wirt S. Scott. 1918—193.
Furnace from the Electrical Standpoint—The Electric—By G. H. Schaeffer, 1918—623.
Furnace Gas and Air for Blowing a Gas Producer—The Application of Blast—By G. R. McDermott, 1925—126.
Furnace Gas—Certain Principles in the Extended Utilization of Blast—By Owen R. Rice, 1928-29—568.
Furnace Gas Cleaning—Blast—By W. J. McGurty, 1928-29—705.
Furnace Gas Cleaning—Blast—By C. W. Hedberg. 1928-29—707.
Furnace Installation—Electric—By R. S. Sawdey, 1924—725.
Furnace Installations—Medium Temperature—By C. F. Cone, 1924—747.
Furnace Manufacturer—Some of the Business Aspects of the—By F. C. Manker, 1929-30—132.
Furnace—Mechanical and Electrical Operation of the Heroult Electric Arc—By G. W. Richardson, 1916—399.
Furnace Operating Data—Electric Heat Treating—By R. W. Heller, 1927—136.
Furnace—Operation of an Open Hearth—By M. J. Conway, 1929-30—394.
Furnace Phenomena—Electric—By E. T. Moore, 1923—569.
Furnace Power Plant—New Blast—Fairfield Works—Tennessee Coal Iron and Railroad Company—By J. M. Sprague, 1928-29—721.
Furnace Plant—Power Generation By Blast—By O. C. Callow, 1925—101.
Furnace Practice—Review of Electric Iron and Steel During 1927—W. E. Lewis, 1928-29—5.
Furnace—Progress in the Iron and Steel Industry and the Electric—By Carl G. Frank, 1915—105.
Furnace Regenerators—The Insulation of Open Hearth—By L. B. McMillan, 1928-29—199.
Furnace Skip and Bell Hoists—Blast—By A. E. Handy, 1912—15.
Furnace Skip Hoists—Ward Leonard Control as Applied to Blast—By E. Anderson, 1928-29—477.
Furnace Steel Processes—The Metallury of Electric—By L. B. Lindemuth, 1918—609.
Furnace—Tests with an Electrical Bright Annealing—By E. Schreiber, 1927—377.
Furnace—The Automatic Blast—By F. W. Cramer, 1925—88.
Furnace—The Central Station and the Electric—By W. H. Cogswell, 1916—45.
Furnace—The Electric Annealing—By James Kniveton, 1929-30—305.
Furnace—The Melting of Alloys in the Electric—By R. S. Wile, 1915—393.
Furnace—The Production of Steel and Iron in the Electric—By E. W. Yearsley, 1909—Paper 1.
Furnace Walls—Insulation of Hot Surfaces and—By L. B. McMillan, 1925—158.
Furnaces and Skip Hoists—Ore Unloaders—Blast—By D. W. Blakeslee, 1926—317.
Furnaces and Their Application to Leveling Up Load Curves—Essentials of Design of Electric Industrial—By G. P. Mills, 1925—11.
Furnaces—Application of Pulverized Coal to Metallurgical—By W. O. Renkin, 1929-30—19.
Furnaces—Application of Waste Heat Boilers to Open Hearth—By Thomas R. Tate, 1920—641.
Furnaces at Wisconsin Steel Works—The Use of Mixed Gas (Blast Furnace and Coke Oven Gas) on Open Hearth—By G. E. Rose and F. M. Washburn. 1929-30—574.
Furnaces—Automatic Door Hoist for Open Hearth—By W. H. Burr and H. A. Lewis, 1918—209.
Furnaces, Brier Hill Sheet Mill, Youngstown Sheet & Tube Co.—Heating—By Strickland Kneass, Jr., 1925—85.
Furnaces Burning Oil—A Recuperator Unit for Industrial—By A. E. Walden, 1928-29—281.
Furnaces—Combustion Control for Industrial—By F. J. Ryan, 1927—493.

Furnaces—Continuous Bloom and Billet Heating—By E. W. Trexler, 1926—190.
Furnaces—Discussion in Connection with Heating—By A. F. Mitchell, 1924—571.
Furnaces—Electric—By J. A. Seede, 1909—Paper 8.
Furnaces—Electric—By J. D. Donovan, 1917—671.
Furnaces—Electric—By G. H. Schaeffer and L. B. Lindemuth, 1918—609.
Furnaces—Electric Annealing and Heat Treating—By G. P. Mills. 1921—1.
Furnaces—Electric Melting—By J. A. Seede, 1925—240.
Furnaces—Electric Melting—By J. A. Seede, 1924—735.
Furnaces—Experiences with Electrical Bright Annealing—By A. Pomp, 1927—377.
Furnaces for Heat Treating—Electric Salt Bath—By A. E. Bellis, 1929-30—311.
Furnaces—Fuel for Continuous Normalizing—By J. W. Jones, 1928-29—696.
Furnaces—Heroult Electric—By W. C. Kennedy, 1917—287.
Furnaces in Manufacturing—Electric—By N. R. Stansel, 1926—311.
Furnaces in the Steel Industry—Present Status of Electric—Electric Furnace Committee, R. D. Nye, Ch., 1919—481.
Furnaces—Metal Air Heater for Industrial—By Waldemar Dyrssen 1928-29—23.
Furnaces—Notes on the Present Status of Electric—By Wilfred Sykes, 1913—283.
Furnaces—Proper Combustion for—By W. P. Chandler, Jr., 1928-29—14.
Furnaces—Recent Developments of Electric Skip Hoists and Bell Hoists for Blast—By D. L. Lindquist, 1918—43.
Furnaces—The Application of Pulverized Coal to Industrial—By W. A. Shoudy, 1928-29—123.
Furnaces Used in the Melting and Refining of Ferrous Metals—Selection of Electrical Equipment for Arc—By Samuel Arnold, III, 1928-29—487.
Fuses—Outdoor Substation Practice and Use of Carbon Tetrachloride—By Alfred Alsaker, 1919—55.
Future—Electrification and Simplification—Their Effect Upon the Foundry's—By L. W. Egan, 1926—191.
Future of Electricity in the Steel Industry—The—By W. H. Burr, 1925—VIII.
Future of Safety—The—By Frank H. Rowe, 1928-29—150.
Future Thoughts in Fuel Economy—By J. D. Donovan, 1929-30—408.

G

Galvanizing—Electric—By R. M. Cherry, 1929-30—299.
Gary Indiana—Electrical Distributing System and Equipment of the National Tube Company—By Edwin L. Upp, 1928-29—55.
Gary—New Resistance Grid Interlocking Systems—Controlling Apparatus at—By C. T. Henderson, 1908—Paper 8.
Gas Analysis—Judging the Combustion of Gaseous Fuels from—By A. G. Witting, 1922—499.
Gas and Air for Blowing a Gas Producer—The Application of Blast Furnace—By G. R. McDermott, 1925—126.
Gas (Blast Furnace and Coke Oven Gas) on Open Hearth Furnaces at Wisconsin Steel Works—Use of Mixed—By G. E. Rose and F. M. Washburn, 1929-30—574.
Gas—Certain Principles in the Extended Utilization of Blast Furnace—By Owen R. Rice, 1928-29—568.
Gas—Cleaning—Blast Furnace—By C. W. Hedberg, 1928-29—707.
Gas Cleaning—Blast Furnace—By W. J. McGurty, 1928-29—705.
Gas Electrically—Measuring—By J. C. Wilson 1918—115.
Gas Engine Driven Generators—By B. A. Behrend, 1907—Paper 18.
Gas—Flow Measurement in Connection with Coke Oven—By J. M. Spitzglass, 1929-30—381.
Gas on Open Hearth Furnaces at Wisconsin Steel Works—The Use of Mixed Gas (Blast Furnace and Coke Oven—By G. E. Rose and F. M. Washburn, 1929-30—574.
Gas Producer Operation—By F. E. Leahy, 1926—181.
Gas Producer—The Application of Blast Furnace Gas and Air for Blowing a—By G. R. McDermott, 1925—126.
Gas Producers—By F. E. Leahy. 1929-30—1.
Gas Producers—Control of Pressure—By W. P. Chandler, Jr., 1924—289.
Gas to Industry—Value of By-Product—By H. Dobrin, 1922—79.
Gas Utilization Committee of A. I. & S. E. E.—Report of—By W. N. Flanagan, 1928-29—693.
Gas—Value of Luminosity in—By A. G. Witting, 1928-29—694.
Gases and Their Use in Iron and Steel Plants—Fuel—By H. S. Watts, 1922—97.
Gases—Foreign Practice and Some Examples of the Tendency Toward Conservation of Low Grade and Waste—By J. C. Hayes, 1928-29—695.
Gases in Iron and Steel Plants—The Efficient Burning of Fuel and the Use of Waste—By W. W. Pettibone, 1922,—49.
Gases—Mixed—H. C. Siebert—1928-29—4.
Gaseous Fuels—By Walter Flanagan, 1928-29—467.
Gaseous Fuels from Gas Analysis—Judging the Combustion of—By A. G. Witting, 1922—499.
Gasoline Locomotives—Material Handling Using—By G. D. Whitcomb, 1928-29—593.
Gautier Mills from a Safety Standpoint—Bethlehem Steel Company's New—By J. A. Northwood, 1926—309.
Gautier Plant, Cambria Works, Bethlehem Steel Co., Johnstown, Pa.,—New Rolling Mills—By R. H. Stevens, 1926 281.
Gear Ratio on Speed of Operation Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives—Influence of—By J. E. Fries, 1919—671.
Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying—By W. H. Himes and R. V. Baud, 1928-29—673.
Gear Teeth—Strength of—By E. Kieft, 1926—247.
Geared Main Roll Drives—Factors Involved in the Selection of Direct Connected and—By E. A. Hurme, 1925—49.
Gears and Pinions for Mill and Industrial Service—Tool Steel—By E. S. Sawtelle, 1917—517.
Gears for Steel Mills—Herringbone—By P. C. Day, 1913—295.
Gears in Steel Plants—Application of High Duty Worm—By A. L. Henthorn, 1926—75.
Gears in the Steel Mill Industry—Micarta Non-Metallic—By T. C. Roantree, 1928-29—407.
Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute—By W. H. Himes and R. V. Baud, 1928-29—673.
Gearing for Electric Cranes—Worm—By G. W. Richardson, 1925—87.
Gearless Speed Reducers—By H. M. Edmunds, 1929-30—266.
General Crane Discussion, 1929-30—340.
General Electric Company for Mill Service—Apparatus Built by the—By D. B. Rushmore, 1907—Paper 3.
General Electric Co. MD Motors—The Application of Roller Bearings to—By C. W. Lange, 1928-29—664.
General Ideas and Discussions—By Philadelphia District Membership, A. I. & S. E. E., 1927—457.
General Manager—The Value of Efficient Service Departments to the—By C. S. Proudfoot, 1928-29—601.
General Phases of Pyrometry and Temperature Control in the Steel Industry—By O. Brewer, 1924—11.
General Safety Discussion—By Membership. 1914—625.
General Requirements for Safety—By Safety Committee U. S. Steel Corp. 1927—368—463.
General Safety Movement and Accident Prevention—By A. I. & S. E. E. Safety Committee, H. A. Schultz, Ch., 1917—45.
General Specification for A.C. Motors for Main Roll Drive—By Standardization Commitee, T. E. Tynes, Ch., 1919—569.
General Specifications of A.C. Motors for Main Roll Drives—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Ch., 1921—479.
General Specifications for Electric Overhead Traveling Cranes, Heavy Duty Steel Mill Service—By the Crane Standardization Committee of 1921, F. W. Cramer, Ch., 1921—403.
General Safety Rules—Safety Organization—A. I. & S. E. E. Safety Committee—By F. A. Wiley, Ch., 1922—682.
Generating Apparatus—Recent Developments in Power—By P. M. Lincoln, 1915—45.
Generating Station Development—By D. B. Rushmore and E. Pragst, 1922—473.
Generating Stations—Auxiliaries and Auxiliary Drives for Steam Electric—By A. L. Penniman, Jr., and F. W. Quarles. 1925—255.

Generating Units—Direct Current Turbine—By H. A. Rapelye. 1913—51.
Generation—Advantages of Central Station Power over Steel Plant—By D. B. Rushmore. 1916—21.
Generation and Use of Electric Power in the Steel Industry—Factors Relating to the Economical—By Brent Wiley. 1917—311.
Generation and Utilization—Steam—By L. C. Edgar. 1928-29—697.
Generation By Blast Furnace Plant—Power—By O. C. Callow. 1925—101.
Generation—During 1928—Review of Certain Developments in Fuel Burning and Steam—By Carl Stripe. 1928-29—461.
Generation from Waste Heat and Coal—Steel Plant Power—By B. H. Greene. 1920—21.
Generation in Steel Mills and Its Relation to Frequency—Power—By D. M. Petty. 1921—199.
Generation in Steel Plants—Internal Combustion Engines for Power—By D. M. Petty. 1922—709.
Generation of Electrical Power—The Economical—By A. B. Clark. 1921—601.
Generation of Electrical Power: Using Waste Heat—By F. O. Schnure. 1925—296.
Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the—By W. H. Himes and R. V. Baud. 1928-29—673.
Generation of Steam by Electricity—By P. H. Falter. 1923—231.
Generation of Steam from Coke Breeze—By John Van Brunt. 1925—131.
Generation or Purchased—Electric Power in the Iron and Steel Industry—By Gordon Fox. 1927—134.
Generation—Pulverized Firing in Steam—By F. J. Crolius. 1921—161.
Generation—Waste Heat Utilization for Steam—By G. R. McDermott. 1921—357.
Generator, Frequency Changer Equipments—Speed Regulating Induction Motor Synchronous—By H. C. Uhl. 1926—83.
Generator Sets and Rotary Converters for D.C. Systems—Advantages of Motor—By P. Lincoln. 1907—Paper 14.
Generators and Induction Motors—A.C.—By E. Heitman. 1907—Paper 8.
Generators and Motors—Frog Leg Windings—Direct Current Armature Windings for Multi-Polar—By W. H. Powell and G. M. Albrecht. 1925—198.
Generators and of D.C. Generators with Synchronous Converters—Parallel Operation of D.C.—By E. Pragst. 1927—358.
Generators—Carbon Brushes for Motors and—By G. M. Little. 1928-29—514.
Generators—Gas Engine Driven—By B. A. Behrend. 1907—Paper 18.
Generators—Regulation of Alternating Current—A. I. & S. E. E., Junior Division. 1929-30—163.
Generators—Standard Testing of Direct Current Motors and—A. I. & S. E. E., Junior Division. 1928-29—413.
Generators—The Parallel Operation of Mercury Arc Rectifiers, with each other, with Rotary Converters and with Motor—By O. K. Marti. 1927—353.
Generators—Turbo—By Richard H. Rice. 1917—479.
Generators vs. Rotary Converters—Motor—By E. Friedlaender. 1915—57.
Generators with Synchronous Converters—Parallel Operation of D.C. Generators and D.C.—By E. Pragst. 1927—358.
Glare versus Illumination—Gloom and; A. I. & S. E. E., Junior Division—By K. A. Staley. 1928-29—359.
Gloom and Glare versus Illumination; A. I. & S. E. E., Junior Division—By K. A. Staley. 1928-29—359.
Good Order as an Essential for Safety—By J. A. Voss. 1926—242.
Good Steel Mill Illumination—Some Features of—By Ward Harrison. 1911—198.
Governing Locomotive Crane Operators and Brakemen—Safety Rules—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Governing the Design of Roller Bearings for Roll Necks—Factors—By F. H. Buhlmann. 1927—208.
Governing the Operation of High Tension System—Rules. 1928-29—135.
Governing the Purchase of Coal—Factors—By Morgan B. Smith. 1928-29—172.
Government of Employees Working on Electrical Equipment—Safety Rules for—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Ch. 1919—315.
Grab Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking—By James Farrington and R. H. McClain. 1917—439.
Graphic Recorder for Steel Mill Service—New—By H. W. Young. 1910—63.
Great Britain—Utilization of Fuel in—By T. A. Peebles. 1928-29—587.
Grid Interlocking Systems—Controlling Appaartus at Gary—New Resistance—By C. T. Henderson. 1908—Paper 8.
Ground Wires—Transmission Line Insulation and Overhead By W. W. Lewis. 1928-29—301.
Ground them for Safe Operation—Portable Electric Tools in the Steel Industry—By W. M. Runyon. 1928-29—692.
Grounded Neutral—By Robert Treat. 1920—187.
Grounded Neutral—Experiences in the Steel Industry with—By A. C. Cummins. 1928-29—104.
Grounded Neutral—Experience of a Public Utility with—By G. S. Humphrey. 1928-29—98.
Grounded Neutral on the Efficiency of Lightning Protection Equipment—The Effect of—By K. B. McEachron. 1928-29—95.
Grounding on Telephone Interference—Effect of—By J. J. Pilliod. 1928-29—82.
Grounding on the Reliability of Relay Operation—Effect of—By E. A. Hester and B. M. Jones. 1928-29—102.
Grounding the Neutral—By E. D. Sibley. 1925—191.
Grounding the Neutral for D.C. Distribution Systems—By W. H. Price. 1919—305.
Grounding—Theory of—By F. C. Hanker. 1928-29—91.
Growth of the A .I. & S. E. E.—By R. S. Shoemaker. 1926—X.
Guarding Against the Invisible Hazards of Electrical Installations—By W. Greenwood. 1926—224.
Guide Forms—Specification and—By J. J. Booth. 1929-30—179.
Guide Forms—A. I. & S. E. E. Steel Mill Auxiliary Control Specification—1929-30—170.
Gulf States Steel Company—Recent Improvements at—By W. B. Connally. 1928-29—573.

H

Handling Costs—Ore—By W. H. Burr. 1923—747.
Handling—Hot Metal—By Walter De Fries. 1929-30—543.
Handling Using Gasoline Locomotives—Material—By G. D. Whitcomb. 1928-29—593.
Hardware and Insulation Trouble—Transmission—By A. N. Cartwright. 1928-29—299.
Hardware and Insulators—By D. C. Hopper. 1928-29—297.
Haulage—The Application of the Principle of Surface Contact to Industrial—By Chas. L. Kinsloe. 1915—441.
Hazard—Standardization of Electrical Equipment and Its Relation to Accident—By W. Greenwood. 1920—297.
Hazards in the Steel Industry—Electrical—By F. W. Cramer. 1926—290.
Hazards of Electrical Installations—Guarding Against the Invisible—By W. Greenwood. 1926—224.
Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore Bridge Transverse Control for Protection Against Wind and Skewage—By P. R. Canney. 1923—421.
Header Boiler—The Modern—By R. M. Rush. 1922—569.
Heat and Coal—Steel Plant Power Generation from Waste—By B. H. Greene. 1920—21.
Heat Boilers—Factors Which Influence the Choice of Waste—By J. B. Crane. 1928-29—343.
Heat Boilers to Open Hearth Furnaces—Application of Waste—By Thomas R. Tate. 1920—641.
Heat Committee for 1925—Report of Electric—By G. H. Schaeffer, Ch. 1925—228.
Heat Committee for 1926—A. I. & S. E. E. Report of Electric—By W. P. Chandler, Jr. 1926—99.
Heat Committee Report—Electric—A. I. & S. E. E.—By G. H. Schaeffer, Ch. 1927—187.
Heat—Committee—Report of the Electric—A. I. & S. E. E. 1929-30—By G. H. Schaeffer, Ch. 1929-30—67.
Heat Cycle in Boiler Rooms by the Use of Preheated Air for Combustion Purposes—Extending the—By J. G. Worker. 1925—274.
Heat—Electric—By Roger H. Bryant. 1929-30—413.
Heat in the Iron and Steel Industry—Electric—By R. E. Talley. 1926—14.
Heat—Report of the Committee on Electric—A. I. & S. E. E.—By G. H. Schaeffer, Ch. 1928-29—233.

Heat Resisting Alloys and Their Use in the Steel Plant—By J. D. Corfield. 1928-29—549.
Heat—The Generation of Electric Power Using Waste—By F. O. Schnure. 1925—296.
Heat Treating—Electric Salt Bath Furnaces for—By A. E. Bellis. 1929-30—311.
Heat Treating Furnace Applications—Electric—By E. A. Hurme. 1925—229.
Heat Treating Furnace Operating Data—Electric—By R. W. Heller. 1927—136.
Heat Treating Furnaces—Electric Annealing and—By G. P. Mills. 1921—1.
Heat Treatment—Electric—By C. A. Winder. 1919—507.
Heat Treatment—The Tangible Advantages of Electric—By Wirt S. Scott. 1929-30—289.
Heat Utilization for Steam Utilization—Waste—By G. R. McDermott. 1921—357.
Heated Hot Top Ingots—Electrically—By F. C. Watson. 1926—1.
Heated Soaking Pits—Electrically—By B. G. Bailey. 1925—367.
Heater for Industrial Furnaces—Metal Air—By Waldemar Dyrssen. 1928-29—23.
Heating and Contactor Wear in Auxiliary Steel Mill Drives—Influence of Gear Ratio on Speed of Operation, Motor—By J. E. Fries. 1919—671.
Heating and Steam Extraction in Steel Mill Power Plants—Possibilities in Stage—By H. T. Watts. 1923—105.
Heating Applied to the Steel Industry—Electric—By F. A. Hansen. 1922—837.
Heating Conference—Electric—A. I. & S. E. E., and Pennsylvania State College. 1929-30—281.
Heating Furnaces, Brier Hill Sheet Mill, Youngstown Sheet & Tube Co.—By Strickland Kneass, Jr. 1925—85.
Heating Furnaces—Continuous Bloom and Billet—By E. W. Trexler. 1926—190.
Heating Furnaces—Discussion in Connection with—By A. F. Mitchell. 1924—571.
Heating of Finishing Rolls of Sheet and Tin Mills—Electric—By Gordon Fox. 1923—253.
Heating of Ingots by Electricity—By R. A. Butler. 1925—246.
Heating of Underground Cables—By A. L. Freret. 1919—209.
Heating with Special References to Central Stations—Electric—By E. D. Sibley. 1924—799.
Heavy Capacity Low Voltage Cables—Spacing of—W. H. Boyce. 1928-29—32.
Heavy Duty D.C. Motors in Steel Plants—Heavy Starting and—By G. W. Richardson. 1907—Paper 2.
Heavy Duty Steel Mill Service—General Specifications for Electric Overhead Traveling Cranes—By the Crane Standardization Committee of 1921—F. W. Cramer, Ch.—1921—403.
Heavy Materials—Electric Welding of—By J. F. Lincoln. 1929-30—296.
Heavy Starting and Heavy Duty D.C. Motors in Steel Plants—By G. W. Richardson. 1907—Paper 2.
Heavy Torque and Rapid Reversals—Electric Motors for—By G. W. Richardson. 1908—Paper 3.
Heine Boiler Practice in 1922—By E. R. Fish and Albert Cotton. 1922—572.
Helpful—How the Electrical Engineer and the Safety Engineer can be Mutually—By J. A. Oartel. 1925—220.
Heroult Electric Arc Furnace—Mechanical and Electrical Operation of the—By G. W. Richardson. 1916—399.
Heroult Electric Furnaces—By W. C. Kennedy. 1917—287.
Herringbone Gears for Steel Mills—By P. C. Day. 1913—295.
High Candle Power Mazda Lamps for Steel Mill Lighting—By G. H. Stickney. 1914—649.
High Duty Worm Gears in Steel Plants—Application of—By A. L. Henthorn. 1926—75.
High Pressure Lubrication—By F. D. Street. 1928-29—330.
High Pressure Steam Boilers—By D. S. Jacobus. 1923—753.
High Spots in Iron and Steel Plant Expansions—Year 1929—1929-30—246.
High Tension Insulators from Flashover—Protection of—B H. B. Vincent. 1928-29—311.
High Tension Power—Safe Practices in Connection with the Operation of—By T. E. Hughes. 1927—167.
High Tension Power—Safe Practices in Connection with the Operation of—By A. N. Cartwright. 1927—159.
High Tension Practice in Modern Plants—By Eugene Vinet. 1928-29—245.
High Tension Practices—Steel Mill—By F. O. Schnure. 1928-29—182.
High Tension System—Rules and Regulations Pertaining to Operation of a Steel Plant—By R. M. Hussey. 1928-29—197.
High Tension System—Rules Governing the Operation of—1928-29—135.
High Voltage Rules, Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—125.
History of the Edgar Thomson Works of the Carnegie Steel Co.—By L. C. Edgar. 1928-29—116.
Hog Island Shipyard—The Electrical Features of—By H. W. Osgood. 1919—33.
Hoist and Trolley Control for Ore Bridges—Direct Current—By N. L. Mortenson. 1924—879.
Hoist Characteristics—Single Bucket, Blast Furnace Skip—By A. C. Cummins and A. R. Leavitt. 1923—453.
Hoist for Open Hearth Furnaces—Automatic Door—By W. H. Burr and H. A. Lewis. 1918—209.
Hoist Travel Limit Devices—Crane—By W. Greenwood. 1924—701.
Hoist Travel Limits on Overhead Cranes—By Walter Greenwood. 1929-30—359.
Hoists and Bell Hoists—Electric Skip—By H. D. James and F. J. Burd. 1917—17.
Hoists and Bell Hoists for Blast Furnaces—Recent Development of Electric Skip—By D. L. Lindquist. 1918—43.
Hoists—Blast Furnace Skip and Bell—By A. E. Handy. 1912—15.
Hoists—Electric Skip Hoists and Bell—By H. D. James and F. J. Burd. 1917—17.
Hoists for Blast Furnaces—Recent Developments of Electric Skip Hoists and Bell—By D. L. Lindquist. 1918—43.
Hoists for Open Hearth Ladle Cranes—Main—By W. W. Garrett, Jr. 1919—271.
Hoists Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking—Grab Bucket Coal—By James Farrington and R. H. McClain. 1917—439.
Hoists—Ore Unloaders, Blast Furnaces and Skip—By D. W. Blakeslee. 1926—317.
Hoists—Safety Limit Stops for—By D. C. Wright. 1929-30—349.
Hoists—Some Factors Entering Into the Selection of Motors for Mine—By F. W. Cramer and A. A. MacDonald. 1923—627.
Hoists—Ward Leonard Control as Applied to Blast Furnace Skip—By E. Anderson. 1928-29—477.
Homestead Steel Works, Carnegie Steel Company, Munhall, Pa.—Electrical Installations, Structural Mills—By C. A. Menk. 1927—214.
Hoop Mill Drives—Strip and—1929-30—222.
Hot Metal Handling—By Walter De Fries. 1929-30—543.
Hot Mill Service—Electric Locomotive for—By David J. Munro. 1927—236.
Hot Saws—Direct Connected—By Nelson D. Cooper. 1927—71.
Hot Surfaces and Furnace Walls—Insulation of—By L. F McMillan. 1925—158.
Hot Top Ingots—Electrically Heated—By F. C. Watson. 1926—1.
How Electric Industrial Truck and Tractor Equipment is Effecting Savings in the Iron and Steel Industry—By H. J. Payne. 1926—162.
How the Electrical Engineer and the Safety Engineer can be Mutually Helpful—By J. A. Oartel. 1925—220.
Hydraulic Valves—Latest Practice in—By David Brownlee 1927—413.
Hydraulic vs. Electric Drive for Steel Mill Auxiliaries—By R. B. Gerhardt. 1919—85.
Hydrogen—Arc Welding—Atomic—By J. D. Wright. 1928-29—47.
Hydrogen—Simultaneous Production of Oxygen and—By I. H. Levin. 1923—117.

I

Ideas and Discussion—General—By Philadelphia District Membership—A. I. & S. E. E. 1927—457.
Illinois Steel Co. Accident Prevention—Joliet Works—By John Eib. 1928-29—65.

Illumination—A Progress Report on—By Ward Harrison and H. H. Madgsick. 1913—241.
Illumination Calculations—Curves and Data for—By C. J. Mundo. 1912—188.
Illumination—Cranes, Control, Prime Movers and Motors—Transmission—Report of Standardization Committee for —1918—495.
Illumination—Discussion of Paper on Steel Works—By B. R. Shover. 1911—198.
Illumination—Gloom and Glare versus—A. I. & S. E. E. Junior Division—By K. A .Staley. 1928-29—359.
Illumination in Relation to Safety—D. W. Blakeslee. 1928-29—6.
Illumination—Iron and Steel Works—By C. J. Mundo. 1911—165.
Illumination of Iron and Steel Mills—By G. H. Stickney. 1910—37.
Illumination—Report of Standardization Sub-Committee on —By H. L. Kirschberg, Ch. 1921—489.
Illumination—Report of Sub-Committee on—By Ward Harrison Ch. 1920—569.
Illumination—Report Sub-Committee A. I. & S. E. E.—By R. G. Bauer. 1922—662.
Illumination—Some Features of Good Steel Mill—By Ward Harrison. 1911—198.
Illumination—What Change?—Fifteen Years of Steel Mill—By Ward Harrison. 1927—143.
Illuminations in Iron and Steel Industry—Modern—By C. E. Clewell. 1912—213.
Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to —By W. H. Himes and R. V. Baud. 1928-29—673.
Impingement Method—Cleaning Air by the Adhesive—By J. H. Milliken. 1929-30—55.
Important Phases of Electric Power for Steel Mills—Some —By Charles F. Scott. 1909—Paper 3.
Improved Rolling Mill Practice Obtained by the Use of Direct Current Motors for Main Roll Drive—By G. E. Stoltz. 1922—849.
Improvement in Efficiency of Electric Power Supply—By C. P. Steinmetz. 1922—691.
Improvements at Gulf States Steel Company—Recent—By W. B. Connally. 1928-29—573.
Improvements at the Plant of the Carpenter Steel Company During the Last Decade—By E. J. Poole. 1926—9.
Improvements in Industrial Control—Recent—By H. D. James. 1919—447.
Improvements in Steam Practice as Accomplished at Lukens Steel Co.—By G. D. Spackman. 1923—703.
Improvements on Rolling Mills—Radical—By J. H. Van Campen. 1927—137.
Improving Non-Condensing Power Plant by Use of Direct Current, Mixed Pressure Turbine Equipment, Etc—By R. F. Patterson. 1915—153.
Incandescent Lamp in the Steel Industry—The—By Ward Harrison. 1912—185.
Incorporation of Safety in Electric Station Design—The—By V. R. Bacon. 1928-29—615.
Increase Production—Practical Education of Steel Mill Electricians to—By Educational Committee—B .A. Cornwell, Ch. 1920—255.
Increased Requirements of Switching Equipment Due to Increased Service Capacity—By W. H. Andrew. 1928-29—441.
Increased Service Capacity—Increased Requirements of Switching Equipment Due to—By W. H. Andrew. 1928-29—441.
Indiana Harbor—New Sheet Bar and Skelp Mill at—By A. E. Beardmore. 1927—238.
Indirect Effects of Steel Mill Electrification—By S. S. Wales. 1927—132.
Induction Drive—Report on Operation of Stoeckel—By G. H. Winslow. 1908—Paper 1.
Induction Drive—The—By A. P. Stoeckel. 1908—Paper 4.
Induction Motor Starting—Some Recent Developments in—By M. C. Spencer. 1921—277.
Induction Motor, Synchronous Generator, Frequency Changer Equipments—Speed Regulating—By H. C. Uhl. 1926—83.
Induction Motors—A.C. Generators and—By E. Heitman. 1907—Paper 8.
Induction Motors—An Automatic Starter for—By H. F. Stratton. 1917—197.
Induction Motors—Control Characteristics of Direct Current and—By M. A. Whiting. 1913—37.
Induction Motors for Rolling Mill Drive—The Control of—By Wilfred Sykes and G. E. Stoltz. 1914—357.
Induction Motors for Steel Mill Drive—Speed Control of—By J. D. Wright. 1916—693.
Induction Motors with Fly Wheels—Automatic Speed Regulating Equipment for—By E. J. Cheney. 1912—115.
Inductive Time Limit Control—By N. L. Mortenson. 1927 —396.
Industrial Control—Recent Improvements in—By H. D. James. 1919—447.
Industrial Electric Power—Protection and Control of—By C. P. Steinmetz. 1915—15.
Industrial Friendship—Safety Stimulates—By J. A. Voss. 1928-29—469.
Industrial Furnace Design—Recent Developments in—By G. R. McDermott. 1929-30—534.
Industrial Furnaces and Their Application to Leveling Up Load Curves—Essentials of Design of Electric—By G. P. Mills. 1925—11.
Industrial Furnaces Burning Oil—A Recuperator Unit for—By A. E. Walden. 1928-29—281.
Industrial Furnaces—Combustion Control for—By F. J. Ryan. 1927—493.
Industrial Furnaces—Metal Air Heater for—Waldemar Dyrssen. 1928-29—23.
Industrial Furnaces—The Application of Pulverized Coal to —By W. A. Shoudy. 1928-29—123.
Industrial Haulage—The Application of the Principle of Surface Contact to—By Chas. L. Kinsloe. 1915—441.
Industrial Lighting—Cooper Hewitt Lamps for—By F. R. Fortune. 1907—Paper 10.
Industrial Lighting—Some Recent Advances in—By Ward Harrison. 1917—635.
Industrial Locomotives—Electric—By F. E. Fisher. 1924—913.
Industrial Plant Railways—Electrification of—By D. M. Petty. 1922—153.
Industrial Plants—Power Transmission in—By K. M. Raynor. 1922—1.
Industrial Plants—The Application of the Corduroy Crane to—By N. P. Farrar. 1928-29—588.
Industrial Plants—The Measurement of Electricity as Applied to—By H. H. Pratt. 1925—349.
Industrial Plants—Transmission and Distribution of Power in—By D. M. Petty. 1920—309.
Industrial Purposes—Electric Locomotives for—By Walter Fixter and Kenneth Andrew. 1919—283.
Industrial Purposes—Liquid Rheostats for—By Wilfred Sykes. 1910—30.
Industrial Service—Tool Steel Gears and Pinions for Mill and—By E. S. Sawtelle. 1917—517.
Industrial Truck and Tractor Equipment is Effecting Savings in the Iron and Steel Industry—How Electric—By H. J. Payne. 1926—162.
Industry—Accident Experience in the Iron and Steel—1928-29—8.
Industry—A Review of the Proceedings of the A. I. & S. E. E. in Connection with the Development of Anti-Friction Bearings in the Iron and Steel— 1929-30—181.
Industry and the Electric Furnace—Progress in the Iron and Steel—By Carl G. Frank. 1915—105.
Industry and the Electric Utilities—The Steel—By Merrill Skinner and F. D. Mahoney. 1924—651.
Industry—Anti-Friction Bearings for Auxiliaries in the Iron and Steel—By E. S. Jefferies. 1928-29—184.
Industry—Apprenticeship and Educational Work in the Iron and Steel—By A. W. Soderberg. 1915—371.
Industry—Automatic Telephones in the Steel—By S. Suekoff. 1915—419.
Industry—Central Station Power Supply to Iron and Steel —By Joseph McKinley and R. L. Baker. 1917—339.
Industry Demands a Knowledge of Arc Welding—Modern Structural—By C. J. Holslag. 1928-29—35.
Industry—Education and Safety in the Iron and Steel—By L. H. Burnett. 1928-29—262.
Industry—Electric Arc Welding in the Steel—By W. L. Warner. 1925—1.
Industry—Electric Heat in the Iron and Steel—By R. E. Talley, 1926—14.
Industry—Electric Heating Applied to the Steel—By F. A. Hansen. 1922—837.
Industry—Electrical Hazards in the Steel—By F. W. Cramer. 1926—290.

Industry—Electrical Power Distribution in the Steel—By B. T. Beitman. 1922—793.
Industry—Electricity in the Iron and Steel—By J. C. Reed. 1925—307.
Industry—Electricity's Contribution to the Iron and Steel—1929-30—198.
Industry—Engineering in the Steel—By W. H. Warren. 1928-29—604.
Industry—Factors Relating to the Economical Generation and Use of Electric Power in the Steel—By Brent Wiley. 1917—311.
Industry—Frequency Problem in the Steel—By B. G. Lamme. 1921—69.
Industry—General Phases of Pyrometry and Temperature Control in the Steel—By O. Brewer. 1924—11.
Industry—Generation or Purchased—Electric Power in the Iron and Steel—By Gordon Fox. 1927—134.
Industry—Ground them for Safe Operation—Portable Electric Tools in the Steel—By W. M. Runyon. 1928-29—692.
Industry—How Electric Industrial Truck and Tractor Equipment is Effecting Savings in the Iron and Steel——By H. J. Payne. 1926—162.
Industry in the United States—Statistical Data of Electrical Application in the Iron and Steel—By R. Tschentscher. 1914—83.
Industry—Micarta Non-Metallic Gears in the Steel Mill—By T. C. Roantree. 1928-29—407.
Industry—Modern Illuminations in Iron and Steel—By C. E. Clewell. 1912—213.
Industry—Organization of the Electrical Department in the Iron and Steel—By Membership, A. I. & S. E. E.—1919—369.
Industry—Portable Electric Tools as Applied to the Iron and Steel—By A. M. Andresen. 1916—447.
Industry—Present Status of Arc Welding in the Iron and Steel—By Membership. 1919—603.
Industry—Present Status of Electric Furnaces in the Steel—By Electric Furnace Committee. R. D. Nye, Ch. 1919—481.
Industry—Progress in the Steel—By W. H. Burr. 1927—134.
Industry—Protection Against Overvoltages in the Iron and Steel—By H. M. Towne. 1923—49.
Industry—Power in the Iron and Steel—By B. R. Shover. 1924—639.
Industry—Power Systems and the Steel—By E. C. Stone. 1922—279.
Industry—Recent Electrical Applications in the Steel Mill—By G. E. Stoltz. 1917—135.
Industry—Recording and Controlling Instruments in the Iron and Steel—By C. C. Eagle and R. M. Walker. 1928-29—205.
Industry Records Decrease in Output and Value in 1927—Iron Ore. 1928-29—48.
Industry—Some Methods of Best Utilizing Electrification in the Steel—By G. E. Stoltz. 1928-29—651.
Industry—Smoke Abatement in—By M. J. Conway. 1929-30—114.
Industry—Standardized Motors for the Steel—By W. T. Snyder. 1918—99.
Industry—Surveys of Lighting and Voltage in the Steel—By S. G. Hibben. 1928-29—732.
Industry—The Application of Electric Power in the Iron and Steel—By W. S. Hall. 1922—127.
Industry—The Complete Electrification of the Foundry—By L. W. Egan. 1923—377.
Industry—The Contribution of Safety to the Iron and Steel—By John A. Oartel. 1928-29—148.
Industry—The Economic and Social Development of the American Iron and Steel—By T. W. Robinson. 1927—477.
Industry—The Engineer in—By A. C. Cummins. 1925—V.
Industry—The Evolution of Electrification in the Manufacturing—By F. H. Kittredge. 1929-30—411.
Industry—The Flaming Arc Lamp in the Iron and Steel—By A. T. Baldwin. 1914—491.
Industry—The Future of Electricity in the Steel—By W. H. Burr. 1925—VIII.
Industry—The Incandescent Lamp in the Steel—By Ward Harrison. 1912—185.
Industry Today—The Electrical Engineer in the—Steel—By A. J. Standing. 1926—XII.
Industry—Value of By-Product Gas to—By H. Dobrin. 1922—79.
Industry—with Grounded Neutral—Experiences in the Steel—By A. C. Cummins. 1928-29—104.
Inflammable Fluids—Automatically Opening and Closing Receptacles Containing—By Walter Greenwood. 1928-29—444.
Influence of Cheap Oxygen on Economy of Fuel and of Time—The—By E. A. W. Jeffries. 1921—329.
Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives—By J. E. Fries. 1919—671.
Influence the Choice of Waste Heat Boilers—Factors Which—By J. B. Crane. 1928-29—343.
Ingots by Electricity—Heating of—By R. A. Butler. 1925—246.
Ingots—Electrically Heated Hot Top—By F. C. Watson. 1926—1.
Inland Steel Co.—Pressure Regulators at—By C. J. Smith. 1925—305.
Input and Output in Boiler Rooms—Measurement of—By J. M. Spitzglass. 1924—317.
Inspection and Operation of Electrical Apparatus—By J. A. Morgan and J. J. Booth. 1919—369.
Inspection as an Aid to Crane Maintenance—Organized—By T. J. Flaherty. 1929-30—448.
Inspection Trip of Carnegie Steel Company's McDonald Mills. 1918—219.
Inspection Trip of Brier Hill Steel Company Plant at Youngstown, Ohio, May 17, 1919. 1919—155.
Inspection Trip Westinghouse Electric & Mfg. Co.—A. I. & S. E. E. 1928-29—72.
Installation and Operation of Air Compressor Plants for Avoidance of Explosions—By W. Greenwood. 1927—126.
Installation and Operation of Anti-Friction Bearings—Selection—By J. R. T. Bell. 1924—193.
Installation and Operation of Static Condensers—By P. T. Vanderwaart. 1923—739.
Installation at Edgar Thomson Works of Carnegie Steel Company—Recent Boiler Plant—By R. D. Abbiss. 1927—191.
Installation Costs—By G. W. Baumgarten. 1929-30—414.
Installation—Electric Furnace—By R. S. Sawdey. 1924—725.
Installation for Power Factor Correction and Voltage Regulation—A Synchronous Condenser—By W. O. Oschmann. 1914—109.
Installation of Electrical Equipment to Comply with Requirements of Safety—By W. Greenwood. 1915—299.
Installations at Aliquippa Plant of the Jones Laughlin Steel Corp.—Electrical—By R. M. Hussey. 1927—448.
Installations at the Cambria Plant of the Bethlehem Steel Co.—Features of the New Electrical—By F .W. Cramer. 1926—278.
Installations—Brier Hill Sheet Mill, Youngstown Sheet & Tube Co.—Electrical—By E. F. Rhodes. 1925—84.
Installations—Brier Hill Sheet Mill of Youngstown Sheet & Tube Co.—Mechanical—By E. L. McElhenny. 1925—82.
Installations—Guarding Against the Invisible Hazards of Electrical—By W. Greenwood. 1926—224.
Installations in Steel Works—Trend of Recent Boiler—By W. B. Skinkle. 1927—1.
Installations—Medium Temperature Furnace—By C. F. Cone. 1924—747.
Installations of Underground Cables—Practical—By P. H. Torchio. 1923—269.
Installations—Structural Mills Homestead Steel Works Carnegie Steel Co., Munhall, Pa.—Electrical—By C. A. Menk. 1927—214.
Instructing the New Employee in Safety—By A. C. Germain. 1929-30—180.
Instructing the New Employee in Safety—By H. G. Hensel. 1929-30—180.
Instructions—Electrical Department, Bethlehem Steel Co.—Lackawanna Plant Switching. 1928-29—34.
Instruments and Control—Progress in—By J. W. Jones. 1928-29—654.
Instruments in the Iron and Steel Industry—Recording and Controlling—By C. C. Eagle and R. M. Walker. 1928-29—205.
Insulation and Overhead Ground Wires—Transmission Line—By W. W. Lewis. 1928-29—301.
Insulation of Dynamo-Electric Machinery—Effect of Temperature on the—By C. E. Skinner. 1912—287.
Insulation of Hot Surfaces and Furnace Walls—By L. B McMillan. 1925—158.

Insulation of Open Hearth Furnace Regenerators—By L. B. McMillan. 1928-29—199.
Insulation of 220 and 440 Volt Apparatus—Relative Efficiency of—By C. E. Skinner. 1907—Paper 17.
Insulation Problem—Steel Mill Electrical Machinery and the—By C. E. Skinner. 1924—101.
Insulation Troubles—Transmission Hardware and—By A. N. Cartwright. 1928-29—299.
Insulators—Dirt on—By G. W. Lapp. 1928-29—308.
Insulators—Hardware and—By D. C. Hopper. 1928-29—297.
Insulators—Mechanical Design Characteristics of—By G. M. Barrow. 1928-29—305.
Interchange of Power Between Steel Mills and Central Stations—Frequency Converters for—By Fred J. Schwarz. 1926—79.
Interconnections of Electrical Systems—By N. E. Funk. 1929-30—390.
Interesting Auxiliary Motor and Control Applications—New and—By Phelan McShane. 1926—328.
Interference—Effect of Grounding on Telephone—By J. J. Pilliod. 1928-29—82.
Interior of the Blast Furnace—Physical and Chemical Conditions in the—By S. P. Kinney. 1929-30—104.
Interlocking Systems—Controlling Apparatus at Gary—New Resistance Grid—By C. T. Henderson. 1908—Paper 8.
Internal Combustion Engines for Power Generation in Steel Plants—By D. M. Petty. 1922—709.
International Nickel Company's Works for Monel Metal—Electrification of the—By F. C. Watson. 1922—415.
In the Steel Plant and Out—The Electrical Engineer—By F. B. Crosby. 1921—563.
Introduction: Ball and Roller Bearings—By D. M. Petty, Ch., Special Bearings Committee, A. I. & S. E. E. 1924—131.
Inverted Molds—New Stripper for—By F. H. Barnard. 1929-30—14.
Investigation in Operating Cost Reduction—Engineering—By W. W. Garrett. 1927—136.
Investigations in Arc Welding—Some Recent—By O. H. Escholtz. 1917—697.
Invisible Hazards of Electrical Installations—Guarding Against the—By W. Greenwood. 1926—224.
Invisible Relay in Vari-Time Control—The—By W .H. Williams, L. A. Watson and C. H. Rippl. 1928-29—270.
Involved in the Selection of Direct Connected and Geared Main Roll Drives—Factors—By E. A. Hurme. 1925—49.
Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of—By W. H. Himes and R. V. Baud. 1928-29—673.
Iron and Steel—Annual Report of Committee of A. I. E. E.—Applications. 1928-29—445.
Iron and Steel—Electric Furnace Practice During 1927—Review of—By W. E. Lewis. 1928-29—5.
Iron and Steel Engineer—The—By A. J. Standing. 1928-29—1.
Iron and Steel Exposition—Twenty-Sixth Annual Convention and—By F. W. Cramer. 1929-30—403.
Iron and Steel Industry—Accident Experience in the—1928-29—8.
Iron and Steel Industry and the Electric Furnace—Progress in the—By Carl G. Frank. 1915—105.
Iron and Steel Industry—Apprenticeship and Educational Work in the—By A. W. Soderberg. 1915—371.
Iron and Steel Industry—Anti-Friction Bearings for Auxiliaries in the—By E. S. Jeffries. 1928-29—184.
Iron and Steel Industry—A Review of the Proceedings of the A. I. & S. E. E., in Connection with the Development of Anti-Friction Bearings in the—1929-30—181.
Iron and Steel Industry—Central Station Power Supply to—By Joseph McKinley and R. L. Baker. 1917—339.
Iron and Steel Industry—Education and Safety in the—By L. H. Burnett. 1928-29—262.
Iron and Steel Industry—Electric Heat in the—By R. E. Talley. 1926—14.
Iron and Steel Industry—Electricity in the—By J. C. Reed. 1925—307.
Iron and Steel Industry—Electricity's Contribution to the—1929-30—198.
Iron and Steel Industry—Generation or Purchased—Electric Power in the—By Gordon Fox. 1927—134.
Iron and Steel Industry—How Electric Industrial Truck and Tractor Equipment is Effecting Savings in the—By H. J. Payne. 1926—162.
Iron and Steel Industry—in the United States—Statistical Data of Electrical Application—By R. Tschentscher. 1914—83.
Iron and Steel Industry—Modern Illuminations in—By C. E. Clewell. 1912—213.
Iron and Steel Industry—Organization of the Electrical Department in the—By Membership, A. I. & S. E. E. 1919—369.
Iron and Steel Industry—Portable Electric Tools as Applied to the—By A. M. Andresen. 1916—447.
Iron and Steel Industry—Power in the—By B. R. Shover. 1924—639.
Iron and Steel Industry—Present Status of Arc Welding in the—By Membership. 1919—603.
Iron and Steel Industry—Protection Against Overvoltages in the—By H. M. Towne. 1923—49.
Iron and Steel Industry—Recording and Controlling Instruments in the—By C. C. Eagle and R. M. Walker. 1928-29—205.
Iron and Steel Industry—The Application of Electric Power in the—By W. S. Hall. 1922—127.
Iron and Steel Industry—The Contribution of Safety to the—By John A. Oartel. 1928-29—148.
Iron and Steel Industry—The Economic and Social Development of the American—By T. W. Robinson. 1927—477.
Iron and Steel Industry—The Flaming Arc Lamp in the—By A. T. Baldwin. 1914—491.
Iron and Steel Mills—Application of Auxiliary Apparatus in—By S. C. Coey. 1914—183.
Iron and Steel Mills—Illumination of—By G. H. Stickney. 1910—37.
Iron and Steel Mills—Methods of Education for Electrical Employees of—By Educational Committee, A. I. & S. E. E. 1918—303.
Iron and Steel Mills—The Application of Storage Batteries to—By R. C. Hull. 1908—Paper 10.
Iron and Steel Plant Expansions, Year 1929—High Spots in. 1929-30—246.
Iron and Steel Plants—Fuel Gases and Their Use in—By H. S. Watts. 1922—97.
Iron and Steel Plants Review—By B .R. Shover. 1928-29—455.
Iron and Steel Plants—Steam Turbines in—By R. C. Muir. 1910—56.
Iron and Steel Plants—The Efficient Burning of Fuel and the Use of Waste Gases in—By W. W. Pettibone. 1922—49.
Iron and Steel Works Illumination—By C. J. Mundo. 1911—165.
Iron in the Electric Furnace—The Production of Steel and—By E. W. Yearsley. 1909—Paper 1.
Iron Ore Industry Records Decrease in Output and Value in 1927. 1928-29—48.
Isley Furnace Control—The—By G. A. Merkt. 1928-29—556.

J

Jamshedpur—The Electrification of the Tata Iron Works at—By S. Ghosh. 1927—405.
Joliet Works, Illinois Steel Co.—Accident Prevention—By John Eib. 1928-29—65.
Jones and Laughlin Safety Trophy Award for 1927. 1928-29—51.
Jones & Laughlin Steel Corp.—Electrical Installations at the Aliquippa Plant of the—By R. M. Hussey. 1927—448.
Judging the Combustion of Gaseous Fuels from Gas Analysis—By A. G. Witting. 1922—499.
Junior Division, A. I. & S. E. E., Direct Current Magnetic Control. 1928-29—284.
Junior Division A. I & S. E. E., Direct Current Motor Control. 1928-29—138.
Junior Division, A. I. & S. E. E., Elements of Commutation—By Jerry Albrecht. 1928-29—494.
Junior Division, A. I & S. E. E.—Factory Testing of Electrical Apparatus. 1928-29—446.
Junior Division, A. I. & S. E. E., Gloom and Glare vs. Illumination—By K. A. Staley. 1928-29—359.
Junior Division, A. I. & S. E. E., Regulation of Alternating Current Generators. 1929-30—163.
Junior Division, A. I. & S. E. E., Standard Testing, Direct Current Motors and Generators. 1928-29—413.

Junior Division, A. I. S. E. E., Steel Mill Lighting—By K. A. Staley. 1928-29—729.

K

Knowledge of Arc Welding—Modern Structural Industry Demands a—By C. J. Holslag. 1928-29—35.

L

Lackawanna Plant, Bethlehem Steel Co., Switching Instructions Electrical Department. 1928-29—34.
Lackawanna Plant of the Bethlehem Steel Co.—The Electrical Development of the—By F. D. Egan and J. F. Oehler. 1929-30—419.
Ladle Cranes—Main Hoists for Open Hearth—By W. W. Garrett, Jr. 1919—271.
Lamp as Opposed to Other Makes of Flame Lamps—Points in Favor of the A. B.—By G. Frank Slocum. 1910—28.
Lamp in the Iron and Steel Industry—The Flaming Arc—By A. T. Baldwin. 1914—491.
Lamp in the Steel Industry—The Incandescent—By Ward Harrison. 1912—185.
Lamp—Mercury Vapor Quartz—By W. A. D. Evans. 1913—145.
Lamps—Excello Arc—By A. Cair. 1910—59.
Lamps for Industrial Lighting—Cooper Hewitt—By F. R. Fortune. 1907—Paper 10.
Lamps for Steel Mill Lighting—High Candle Power Mazda—By G. H. Stickney. 1914—649.
Lamps—Mill and Metallic Arc—By C. E. Stephens. 1907—Paper 16.
Lamps—Points in Favor of the A. B. Lamp as Opposed to Other Makes of Flame—By G. Frank Slocum. 1910—28.
Lamps—The Fox Multax—By J. J. Batterman. 1910—61.
Lamps—Their Operation and Demonstration—Flaming Arc—By C. J. Toerring. 1909—Paper 12.
Large Motors to Reversing and Non-Reversing Rolling Mills—Application of—By K. A. Pauly. 1907—Paper 4.
Large Rolling Mill Motors—Standardization of Ratings of—By K. A. Pauly. 1918—447.
Larger Users Standpoint—Public Service Corp. from the—By S. S. Wales. 1927—490.
Leblanc Condenser—By Edwin Yawger. 1909—Paper 11.
Lehigh University—Electrical Engineering at—By J. W. Barker. 1929-30—391.
Leveling Up Load Curves—Essentials of Design of Electric Industrial Furnaces and Their Application to—By G. P. Mills. 1925—11.
Lifting Magnets—Design and Use of—By B. E. Fernow, Jr. 1913—101.
Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized—By W. H. Himes and R. V. Baud. 1928-29—673.
Light for Safety—The—By Frank R. Fortune. 1911—155.
Lighting and Voltage in the Steel Industry—Surveys of—By S. G. Hibben. 1928-29—732.
Lighting—Cooper Hewitt Lamps for Industrial—By F. R. Fortune. 1907—Paper 10.
Lighting for Steel Mills—Special—By H. M. Gassman. 1911—160.
Lighting—High Candle Power Mazda Lamps for Steel Mill—By G. H. Stickney. 1914—649.
Lighting Problems—Steel Mill—By R. F. Sanner. 1929-30—552.
Lighting—Some Recent Advances in Industrial—By Ward Harrison. 1917—635.
Lighting—Steel Mill—A. I. & S. E. E.—Junior Division—By K. A. Staley. 1928-29—729.
Lighting—Steel Plant—By M. H. Morgan. 1929-30—11.
Lightning Arresters—By C. E. Bennett. 1920—597.
Lightning Arresters and Factors Effecting Their Performance—Requirement of—By E. D. Tanzer. 1926—29.
Lightning Arrester Design and Research—By H. M. Towne. 1926—301.
Lightning Arrester Protection on 13,200 V. and 2,400 V. Distribution Lines—By A. R. Wood. 1926—25.
Lightning Arresters—New Aluminum Steel—By D. B. Rushmore. 1908—Paper 11.
Lightning Protection—By R. P. Jackson. 1907—Paper 13.
Lightning Protection—Natural Electricity and—By J. Slepian. 1926—32.
Lightning Protection Equipment—The Effect of the Grounded Neutral on the Efficiency of—By K. B. McEeachron. 1928-29—95.
Lightning Protection—The Theory and Practice of—By Q. A. Brackett. 1920—585.
Limit Control—Inductive Time—By N. L. Mortenson. 1927—396.
Limit Devices—Crane Hoist Travel—By W. Greenwood. 1924—701.
Limiting Reactances—Current—By R. H. Keil. 1920—481.
Limits on Overhead Cranes—Hoist Travel—By Walter Greenwood. 1929-30—359.
Limit Stops for Hoists—Safety—By D. C. Wright. 1929-30—349.
Limitations—Mills of the Backed Up Type Remove Cold Rolling—By Lloyd Jones. 1927—498.
Line Construction—Tubular Poles for—By W. T. Snyder. 1912—322.
Line Insulation and Overhead Ground Wires—Transmission—By W. W. Lewis. 1928-29—301.
Lines—Lightning Arrester Protection on 13,200 V. and 2,400 V. Distribution—By A. R. Wood. 1926—25.
Lines—Steel Conductors for Transmission—By H. B. Dwight. 1916—205.
Liquid Fuel—The Combustion of—By Robert C. Vroom. 1928-29—640.
Liquid Rheostats for Industrial Purposes—By Wilfred Sykes. 1910—30.
Liquid Slip Regulator or Rheostat—The—By D. M. Petty. 1923—485.
Ljungstrom Air Preheater—The—By B. G. Brolinson. 1924—461.
Load Curves—Essentials of Design of Electric Industrial Furnaces and Their Application to Leveling Up—By G. P. Mills. 1925—11.
Load—Operation of Series Motors in Parallel When Rigidly Coupled to the Same—By J. A. Jackson. 1927—423.
Loads—The Static Condenser on Steel Mill—By R. W. Dudley. 1925—106.
Locomotive Crane Operators and Brakemen—Safety Rules Governing—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Locomotive and Rolling Equipment of the Reading Company—The Maintenance of—By I. A. Seiders. 1927—29.
Locomotive for Hot Mill Service—Electric—By David J. Munro. 1927—236.
Locomotives for Industrial Purposes—Electric—By Walter Fixter and Kenneth Andrew. 1919—283.
Locomotive in Shuttle Service in a Steel Plant—Performance and Costs of Operating Fireless Steam—By C. H. Hunt. 1929-30—82.
Locomotives—Material Handling Using Gasoline—By G. D. Whitcomb. 1928-29—593.
Locomotives—Electric Industrial—By F. E. Fisher. 1924—913.
Low Grade and Waste Gases—Foreign Practice and Some Examples of the Tendency Toward Conservation of—By J. C. Hayes. 1928-29—695.
Low Pressure Turbines in Steel Plants—By R. C. Muir. 1909—Paper 9.
Low Speed Motors vs. Motors in Series—By R. B. Treat. 1909—Paper 10.
Low Temperature Furnace Applications—Medium and—By E. A. Hurme. 1924—771.
Low Voltage Cables—Spacing of—Heavy Capacity—By W. H. Boyce. 1928-29—32.
Lowering—Recent Developments in Dynamic Braking—By D. C. Wright. 1929-30—263.
Lubricating Cranes—Lubrication and Methods of—By T. E. Tynes. 1911—68.
Lubrication—Adventures in—By H. M. Ludwick. 1927—419.
Lubrication and Methods of Lubricating Cranes—By T. E. Tynes. 1911—68.
Lubrication of Anti-Friction Bearings on Mill and Crane Motors—Special Study Regardnig—A. I. & S. E. E. Special Committee on Bearings—By F. D. Egan, Ch. 1928-29—701.
Lubrication—High Pressure—By F. D. Street. 1928-29—330.
Lubrication—Steel Mill—By E. P. Mallison. 1928-29—327.
Lukens Steel Company—Improvements in Steam Practice as Accomplished at—By G. D. Spackman. 1923—703.
Luminosity in Gas—Value of—By A. G. Witting. 1928-29—694.

Mc

McDonald Mills—Inspection Trip of Carnegie Steel Companys. 1918—219.
McKinney Steel Company—Main Drives 10" Merchant Mill at—By A. F. Kenyon. 1927—455.

M

Machine Shop Safety Rules—Central Alloy Steel Corp—By J. D. Donovan. 1929-30—126.
Machine Tool Control—By H. W. Eastwood. 1914—585.
Machine Tool Drives: Motors and Controllers—By H. W. Tice. 1919—1.
Machine Tools—Standardization of Electrical Apparatus for Cranes and—By H. Cosden. 1917—663.
Machinery and the Insulation Problem—Steel Mill Electrical—By C. E. Skinner. 1924—101.
Machinery—Application of Anti-Friction Bearings to Steel Mill—By G. R. Holmes. 1926—16.
Machinery—Characteristics of Cold Rolling Mill—By J. H. Van Campen. 1928-29—273.
Machinery—Combustion Control by—By C. H. Smoot. 1925—143.
Machinery—Effect of Temperature on the Insulation of Dynamo Electric—By C. E. Skinner. 1912—287.
Machines—Electric Welding—By Frank Warren. 1912—140.
Machines—Fabricated Direct Current—By R. S. Marthens and F. T. Hague. 1929-30—117.
Machines—Factors Affecting the Application of Carbon Brushes to Direct Current—By C. W. Lange. 1928-29—509.
Machines—The Advantages of Modern Types of Direct Current—By David Hall. 1916—83.
Machines—Winding of Electric—By H. G. Specht. 1912—269.
Magnetic and Mechanical Control for Motors—By C. T. Henderson. 1907—Paper 12.
Magnetic Brakes—By B. E. Fernow, Jr. 1914—611.
Magnetic Control Characteristics—By H. F. Stratton. 1914—211.
Magnetic Control Diagrams—Standardization of Steel Mill. 1929-30—547.
Magnetic Control for Auxiliary Motors—Alternating Current and Direct Current—By W. O. Lum. 1914—239.
Magnetic Control for Steel Mill Auxiliaries—By H. H. Angel. 1926—229.
Magnetic Controllers—Direct Current—A. I. & S. E. E. Junior Division. 1928-29—284.
Magnetic Switch Controllers—Combination Manual and—By H. F. Stratton. 1908—Paper 9.
Magnetic Switch Controllers—By C. V. Pirtle. 1907—Paper 11.
Magnets—Design and Use of Lifting—By B. E. Fernow, Jr. 1913—101.
Main Drive Motors for Strip and Skelp Mills—Selection of—By A. F. Kenyon. 1928-29—190.
Main Drives of Merchant, Bar and Rod Mills—Selection of Motors for—By C. B. Huston. 1928-29—160.
Main Drives 10″ Merchant Mill at McKinney Steel Company—By A. F. Kenyon. 1927—455.
Main Hoists for Open Hearth Ladle Cranes—By W. W. Garrett, Jr. 1919—271.
Main Roll Drive—General Specifications for A.C. Motors for—By Standardization Committee—T. E. Tynes, Ch. 1919—569.
Main Roll Drive—Improved Rolling Mill Practice Obtained by the Use of Direct Current Motors for—By G. E. Stoltz. 1922—849.
Main Roll Drive Statistics—1929. 1929-30—197.
Main Roll Drives—Adjustable Speed—By M. H. Morgan. 1928-29—362.
Main Roll Drives—Factors Involved in the Selection of Direct Connected and Geared—By E. A. Hurme. 1925—49.
Main Roll Drives—General Specifications of A.C. Motors for—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Ch. 1921—479.
Main Roll Drives in the United States and Canada. 1929-30—198.
Main Roll Drives—Speed Regulation of the—By L. A. Umansky. 1927—103.
Main Roll Drives—The Application of Direct Current Motors to—By H. A. Winne. 1927—95.
Main Rolls of Steel Mills—Variable Speed Drives for—By K. A. Pauly. 1913—267.
Main Rolls of Steel Mills—Present Status of Motor Drive for—By Brent Wiley. 1913—171.
Main Rolls—Questions on Motor Drive for—By E. Friedlaender. 1913—209.
Maintenance—Ball Bearing Applications and—By H. R. Reynolds. 1924—167.
Maintenance by Autogenous Welding—Steel Plant—By Walter Petry. 1921—679.
Maintenance Costs with the Welding Arc—Cutting Steel Mill—By A. M. Candy. 1925—8.
Maintenance of Electric Motors—By N. L. Rea. 1926—288.
Maintenance of Locomotive and Rolling Equipment of the Reading Company—By I. A. Seiders. 1927—29.
Maintenance of Oil Circuit Breakers—Selection and—By M. J. Wohlgemuth and E. K. Read. 1925—288.
Maintenance of Oil Circuit Breakers—The Selection and—By G. A. Burnham. 1925—267.
Maintenance of Oil—Deterioration and—By Colby W. Bryden. 1929-30—273.
Maintenance of Roller Bearings in Electric Motors—Mounting and—By U. B. Wachtler. 1924—207.
Maintenance of Roller Bearings on Electric Motors—Mounting and—By D. E. Batesole. 1924—155.
Maintenance—Organized Inspection as an Aid to Crane—By T. J. Flaherty. 1929-30—448.
Maintenance Shop Practices—Developments in Electric—By A. C. Cummins. 1924—579.
Makes of Flame Lamps—Points in Favor of the A. B. Lamp as Opposed to Other—By G. Frank Slocum. 1910—28.
Making—Developments in Steam—By Martin Frisch. 1928-29—422.
Making Steel—The Bessemer Process of—By John Sullivan. 1921—91.
Making—Wire Rope and Its Relation to Steel—By James F. Howe. 1915—113.
Manager—The Value of Efficient Service Departments to the General—By C. S. Proudfoot. 1928-29—601.
Manipulators for Blooming Mills—By L. Iverson. 1926—272.
Manipulators for Two High Reversing Blooming Mill—By C. J. Klein. 1926—274.
Manual and Magnetic Switch Controllers—Combination—By H. F. Stratton. 1908—Paper 9.
Manual—Report of Educational Committee for 1921—Crane Operators—By L. F. Galbraith, Ch. 1921—509.
Manufacture of Phosphoric Acid—By Theodore Swann. 1922—361.
Manufacture of Steel—Evolution of the Application of Electricity to the—By G. J. Walz. 1928-29—151.
Manufacture of Tool Steel—Uses of Electricity in the Development and—By O. K. Parmiter. 1929-30—293.
Manufacture—Selection and Use of Carbon Brushes—By E. H. Martindale. 1917—399.
Manufactured by the Alliance Machine Company—Latest Developments of Electric Cranes for Steel Mills—By E. H. Kendall. 1915—281.
Manufacturer—Some of the Business Aspects of the Furnace—By F. C. Manker. 1929-30—132.
Manufacturing—Electric Furnaces in—By N. R. Stansel. 1926—311.
Manufacturing Industry—The Evolution of Electrification in the—By F. H. Kittredge. 1929-30—411.
Market for Rolling Mill Shapes—Arc Welding and The New—By J. F. Lincoln. 1928-29—81.
Material Handling Using Gasoline Locomotives—By G. D. Whitcomb. 1928-29—593.
Materials—Electrical Resistance—By Walter Kennedy. 1921—241.
Materials—Electric Welding of Heavy—By J. F. Lincoln. 1929-30—296.
Materials—Theory of Rolling of Plastic—By F. G. Gasche. 1929-30—505.
Mathematical Theory of the Cottrell Electric Precipitator—On the—By A. W. Simon. 1928-29—535.
Mazda Lamps for Steel Mill Lighting—High Candle Power—By G. H. Stickney. 1914—649.
Means of Reducing Costs—Electrification as a—By G. E. Stoltz. 1928-29—149.
Measurement of Electricity as Applied to Industrial Plants—By H. H. Pratt. 1925—349.
Measurement of Input and Output in Boiler Rooms—By J. M. Spitzglass. 1924—317.
Measurement in Connection with Coke Oven Gas—Flow—By J. M. Spitzglass. 1929-30—381.
Measuring Gas Electrically—By J. C. Wilson. 1918—115.
Mechanical and Electrical Analysis of 40″ Blooming Mill Screwdown—By F. D. Egan. 1924—487.
Mechanical and Electrical Operation of the Heroult Electric Arc Furnace—By G. W. Richardson. 1916—399.

Mechanical Braking—Dynamic vs—By G. W. Richardson. 1921—265.
Mechanical Control for Motors—Magnetic and—By C. T. Henderson. 1907—Paper 12.
Mechanical Design Characteristics of Insulators—By G. M. Barrow. 1928-29—305.
Mechanical Installations, Brier Hill Sheet Mill of Youngstown Sheet and Tube Company—By E. L. McElhinney. 1925—82.
Mechanical Mining of Coal—Electricity Applied to the—By C. B. Reed. 1919—179.
Mechanically Connected Direct—Current Motors Permanently in Series or Permanently in Parallel—The Operation of—By H. F. Stratton. 1916—655.
Mechanically Trained Electrical Men—By W. S. Hall. 1925—VI.
Medium and Low Temperature Furnace Applications—By E. A. Hurme. 1924—771.
Medium Temperature Furnace Installations—By C. F. Cone. 1924—747.
Melting and Refining of Ferrous Metals—Selection of Electrical Equipment for Arc Furnaces Used in the—By Samuel Arnold, III. 1928-29—487.
Melting Furnaces—Electrical—By J. A. Seede. 1924—735.
Melting Furnaces—Electrical—By J. A. Seede. 1925—240.
Melting of Alloys in the Electrical Furnace—The—By R. S. Wile. 1915—393.
Melting of Alloy Steels—Electric—By H. M. German. 1928-29—435.
Men—Mechanically Trained Electrical—By W. S. Hall. 1925—VI.
Men or What the Plant Surgeon Can Do for Safety—The Placement of—By A. W. Colcord. 1928-29—438.
Mental Requirements—Safe Crane Operators Physical and—By C. M. Swindler. 1926—245.
Merchant Bar and Rod Mills—Selection of Motors for Main Drives of—By C. B. Huston. 1928-29—160.
Merchant Mill at McKinney Steel Co.—Main Drives 10"—By A. F. Kenyon. 1927—455.
Merchant Mill Drives. 1929-30—225.
Mercury Arc Rectifiers, with each other, with Rotary Converters and with Motor Generators—The Parallel Operation of—By O. K. Marti. 1927—353.
Mercury Vapor Quartz, Lamp—The—By W. A. D. Evans. 1913—145.
Mesta Flexible Coupling—The—By W. Trinks. 1923—210.
Metal Air Heater for Industrial Furnaces—By Waldemar Dyrssen. 1928-29—23.
Metal Arc Welding—Direct Current—By F. T. Llewellyn. 1928-29—411.
Metal—Electrification of the International Nickel Company's Works for Monel—By F. C. Watson. 1922—415.
Metal Handling—Hot—By Walter De Fries. 1929-30—543.
Metallic Arc Lamps—Mill and—By C. E. Stephens. 1907—Paper 16.
Metallurgical Furnaces—Application of Pulverized Coal to—By W. O. Renkin. 1929-30—19.
Metallurgy of Electric Furnace Steel Processes—The—By L. B. Lindemuth. 1918—609.
Metallurgy—Some Applications of Oxygen to Ferrous—By F. W. Davis. 1924—427.
Metals—Selection of Electrical Equipment for Arc Furnaces Used in the Melting and Refining of Ferrous—By Samuel Arnold, III. 1928-29—487.
Meters and Their Applications in Steel Mills—Watthour and Ampere-Hour—By R. C. Lanphier. 1914—419.
Method—Cleaning Air By the Adhesive Impingement—By J. H. Milliken. 1929-30—55.
Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a—By W. H. Himes and R. V. Baud. 1928-29—673.
Methods and Practices in Selling Steel—New—By J. W. Donner. 1928-29—603.
Methods of Acceleration of Direct Current Mill Auxiliary Motors—By C. J. Smith. 1926—16.
Methods of Best Utilizing Electrification in the Steel Industry—Some—By G. E. Stoltz. 1928-29—651.
Methods of Education for Electrical Employees of Iron and Steel Mills—By Educational Committee, A. I. & S. E. E. 1918—303.
Methods of Lubricating Cranes—Lubrication and—By T. E. Tynes. 1911—68.
Metropolitan Power Company—Design and Test of Susquehanna Station—By J. A. Powell. 1926—48.
Micarta Non-Metallic Gears in the Steel Mill Industry—By T. C. Roantree. 1928-29—407.
Mill Analysis—Rolling—By E. Kieft. 1929-30—438.
Mill and Crane Motors—Special Study Regarding Lubrication of Anti-Friction Bearings on—A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan, Chairman. 1928-29—701.
Mill and Industrial Service—Tool Steel Gears and Pinions for—By E. S. Sawtelle. 1917—517.
Mill and Metallic Arc Lamps—By C. E. Stephens. 1907—Paper 16.
Mill—Anti-Friction Bearings in the Steel—By A. M. MacCutcheon. 1921—429.
Mill Applications—Flywheels for Rolling—By G. E. Stoltz. 1917—721.
Mill Applications—Parallel Operation of Synchronous Converters for Steel—By W. B. Shirk. 1927—356.
Mill as a Factor in Safety—Physical Conditions of a Steel—By H. W. Darr. 1928-29—282.
Mill at Indiana Harbor—New Sheet Bar and Skelp—By A. E. Beardmore. 1927—238.
Mill at McKinney Steel Co.—Main Drives 10" Merchant—By A. F. Kenyon. 1927—455.
Mill Auxiliaries—Cost and Efficiency of Alternating vs. Direct Current Motors for Steel—By B. R. Shover and Edward J. Cheney. 1911—90.
Mill Auxiliary Control Specification Guide Forms—Steel—A. I. & S. E. E. 1929-30—170.
Mill Auxiliaries—Hydraulic vs. Electric Drive for Steel—By R. B. Gerhardt. 1919—85.
Mill Auxiliaries—Magnetic Control for Steel—By H. H. Angel. 1926—229.
Mill Auxiliary Motors—Methods of Acceleration of Direct Current—By C. J. Smith. 1926—16.
Mill Considered from the Standpoint of Tonnage—The Electric Reversing—By K. A. Pauly. 1920—415.
Mill Controller—Full Reverse A.C. Two Speed—By E. G. Peterson. 1926—308.
Mill Crane Problems—Some Steel—By A. J. Standing. 1923—33.
Mill Crane Specifications—Modern Steel—By F. D. Egan. 1916—745.
Mill Cranes—Some Modern Types of Steel—By W. D. Keller. 1927—244.
Mill Drive—Specification for 40" Reversing Blooming. 1928-29—404.
Mill Drive—Speed Control of Induction Motors for Steel—By J. D. Wright. 1916—693.
Mill Drive—The Control of Induction Motors for Rolling—By Wilfred Sykes and G. E. Stoltz. 1914—357.
Mill Drives—Electric—By J. D. Wright. 1920—1.
Mill Drives in Continental Europe—Observations on Rolling—By O. Needham. 1925—187.
Mill Drives—Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in Auxiliary Steel—By J. E. Fries. 1919—671.
Mill Drives—Modern Reversing—By R. H. Wright. 1929-30—374.
Mill Drives—1928 Developments in Steel—By J. D. Wright. 1928-29—465.
Mill Electrical Machinery and the Insulation Problem—Steel—By C. E. Skinner. 1924—101.
Mill Electrical Repair Shop Practices—Steel—By A. J. Standing. 1920—109
Mill Electricians to Increase Production—Practical Education of Steel—By Educational Committee, B. A. Cornwell, Chairman. 1920—255.
Mill Electrification—A Review of Steel—By B. G. Lamme and W. Sykes. 1922—583.
Mill Electrification at the South Works of the American Steel and Wire Co., Worcester, Mass.—Rod—By Roger H. Bryant. 1928-29—429.
Mill Electrification—Indirect Effects of Steel—By S. S. Wales. 1927—132.
Mill—Engine vs. Motor Drive for Reversing Blooming—By C. H. Hunt. 1924—547.
Mill Equipment—Automatic Control of Reversing Rolling—By E. S. Lammers, Jr. 1920—137.
Mill Equipment—Tapered Roller Bearings and Their Applicability to Steel—By F. Waldorf. 1929-30—247.
Mill High Tension Practices—Steel—By F. O. Schnure. 1928-29—182.
Mill Illumination—Some Features of Good Steel—By Ward Harrison. 1911—198.

Mill Illumination—What Change—Fifteen Years of Steel—By Ward Harrison. 1927—143.
Mill Industry—Micarta Non-Metallic Gears in the Steel—By T. C. Roantree. 1928-29—407.
Mill Industry—Recent Electrical Applications in the Steel—By G. E. Stoltz. 1917—135.
Mill in 1927—Rolling—By Barton R. Shover. 1928-29—2.
Mill Lighting—High Candle Power Mazda Lamps for Steel—By G. H. Stickney. 1914—649.
Mill Lighting Problems—Steel—By R. F. Sanner. 1929-30—552.
Mill Lighting—Steel—A. I. & S. E. E., Junior Division—By K. A. Staley. 1928-29—729.
Mill Loads—The Static Condenser on Steel—By R. W. Dudley. 1925—106.
Mill Lubrication—Steel—By E. P. Mallison. 1928-29—327.
Mill Machinery—Application of Anti-Friction Bearings to Steel—By G. R. Holmes. 1926—16.
Mill Machinery—Characteristics of Cold Rolling—By J. H. Van Campen. 1928-29—273.
Mill Magnetic Control Diagrams—Standardization of Steel. 1929-30—547.
Mill Maintenance Costs with the Welding Arc—Cutting Steel—By A. M. Candy. 1925—8.
Mill—Manipulator for Two High Reversing Blooming—By C. J. Klein. 1926—274.
Mill Motors—By Gano S. Dunn. 1907—Paper 7.
Mill Motors—Crocker Wheeler—By Gano S. Dunn. 1908—Paper 14.
Mill Motors—Roller Bearings Applied to—By L. J. Hess. 1922—811.
Mill Motors—Standardization of Ratings of Large Rolling—By K. A. Pauly. 1918—447.
Mill—Operating Characteristics of an Electric Reversing Blooming—By E. S. Jefferies. 1916—309.
Mill Power Plants—Possibilities in Stage Heating and Steam Extraction in Steel—By H. T. Watts. 1923—105.
Mill Practice—Foreign Steel—By W. H. Burr. 1925—178.
Mill Practice—Foreign Steel—By F. L. Estep. 1925—179.
Mill Practice Obtained by the Use of Direct Current Motors for Main Roll Drive—Improved Rolling—By G. E. Stoltz. 1922—849.
Mill Practice—Some Electrical Applications in Steel—By D. M. Petty. 1915—233.
Mill Practice to Arc Welding—Applying the Principles of Steel—By J. B. Austin. 1929-30—499.
Mill Practices—Rolling—Germany, Spain, Russia—By F. L. Estep. 1928-29—526.
Mill—Remodeled and Electrified Rod—By S. N. Roberts. 1925—24.
Mill Screwdown—Mechanical and Electrical Analysis of 40-Inch Blooming—By F. D. Egan. 1924—487.
Mill Service—Apparatus Built by the General Electric Company for—By D. B. Rushmore. 1907—Paper 3.
Mill Service—Application of the Automatic Substation to Steel—By A. P. Ding. 1928-29—490.
Mill Service—Electric Locomotive for Hot—By David J. Munro. 1927—236.
Mill Service—General Specifications for Electric Overhead Traveling Cranes, Heavy Duty Steel—By the Crane Standardization Committee of 1921, F. W. Cramer, Chairman. 1921—403.
Mill Service—New Graphic Recorder for Steel—By H. W. Young. 1910—63.
Mill Service—Recent Developments of Motors for Steel—By Brent Wiley. 1911—82.
Mill Service—Transformers for Steel—By E. Friedlaender. 1911—46.
Mill Service—Type W. Motors for—By R. B. Treat. 1907 Paper 9.
Mill Shapes—Arc Welding and the New Market for Rolling—By J. F. Lincoln. 1928-29—81.
Mill Starter for D.C. Motors—A Steel—By C. V. Pirtle. 1909—Paper 4.
Mill Synchronous Motors—Starting Characteristics of Steel—By H. H. Angel. 1928-29—539.
Mill Table Controllers—Standardized—By J. S. Rowan. 1918—169.
Mill Table Drives—A.C. vs. D.C. Motors for Rolling—By W. S. Hall. 1919—419.
Mill Tables and Screw Downs—Control of—By W. C. Kennedy. 1920—223.
Mill Transportation—Yard Switching and—By W. B. Potter and G. H. Shapter. 1926—144.
Mill Type Motor—Final Outline Dimensions for A. I. & S. E. E.—By A. C. Cummins, Chairman, Standardization Committee. 1928-29—247.
Mill Type Motor—New—By J. A. Seede. 1907—Paper 5.
Mill Type Motor—Standardized Commutating Pole—By Standardization Committee, A. I. & S. E. E., A. C. Cummins, Chairman. 1926—262.
Mill Type Motors, A.C. and D.C. with Controllers—By D. F. Smalley. 1908—Paper 12.
Mill—Wisconsin Steel Co.—40" Reversing Blooming—By F. A. Wiley. 1928-29—58.
Mill—Youngstown Sheet & Tube Company—Electrical Installations, Brier Hill Sheet—By E. F. Rhodes. 1925—84.
Mill—Youngstown Sheet & Tube Company—Heating Furnaces, Brier Hill Sheet—By Strickland Kneass, Jr. 1925—85.
Mill—Youngstown Sheet & Tube Company—Mechanical Installations, Brier Hill Sheet—By E. L. McElhinney. 1925—82.
Mill—10" Strip—American Steel and Wire Company—By F. A. Snyder and R. H. Wright. 1929-30—128.
Mill—120" Motor Driven Plate—By W. C. Kennedy. 1923—39.
Mills—Adjustable Speed Drives for Rolling—By L. A. Umansky. 1924—817.
Mills and Central Stations—Frequency Converters for Interchange of Power Between Steel—By Fred J. Schwarz. 1926—79.
Mills and Foundries—Arc Welding Equipment for Steel—By H. L. Unland. 1919—606.
Mills and Its Relation to Frequency—Power Generation in Steel—By D. M. Petty. 1921—199.
Mills and Other Drives—Flexible Couplings for Steel—By J. J. Serrell. 1923—177.
Mills and Pinion Stands—Application of Tapered Roller Bearings on Roll Necks of Rolling—By Fred Waldorf. 1927—178.
Mills and the Use of Central Station Power—The Electrification of Steel—By Brent Wiley and Wilfred Sykes. 1915—177.
Mills—Anti-Friction Bearings on Roll Necks of Rolling—By E. C. Gainsborg. 1927—184.
Mills—Application of Anti-Friction Bearings to Roll Necks of Steel—By E. C. Gainsborg. 1927—36.
Mills—Application of Auxiliary Apparatus in Iron and Steel—By S. C. Coey. 1914—183.
Mills—Application of Central Station Power to Steel—By T. E. Tynes. 1916—41.
Mills—Application of Large Motors to Reversing and Non-Reversing Rolling—By K. A. Pauly. 1907—Paper 4.
Mills—Application of Synchronuous Motors to Continuous—By F. O. Schnure. 1925—86.
Mills at McDonald Ohio—Inspection Trip of Carnegie Steel Company's. 1918—219.
Mills at Steubenville Plant of the Wheeling Steel Corp—Additions to Rolling—By M. J. Conway. 1926—114.
Mills—Automatic and Remote Controlled Sub-Stations as Applied to Steel—By J. K. Ostrander. 1922—365.
Mills—Auxiliary Motors for Steel—By J. D. Wright. 1918—599.
Mills—Bearings for Use in Rolling—By C. J. Klein. 1927—149.
Mills—Central Station Power for Steel—By Central Station Power Committee, A. I. & S. E. E., C. S. Lankton, Chairman. 1916—21.
Mills—Comparative Value of Fuels in Steel—By H. V. Flagg. 1929-30—367.
Mills—Control of Motor Driven Auxiliary Apparatus in Steel—By H. D. James. 1908—Paper 5.
Mills—Cranes for Steel—By J. Matthewson. 1929-30—28.
Mills—Discussion—Steam vs. Electric Driven—By Membership, A. I. & S. E. E. 1920—35.
Mills—Economics of Electric Drive in Steel—By Wilfred Sykes. 1914—597.
Mills—Electric Drives for Reversing Rolling—By D. M. Petty. 1917—361.
Mills—Electric Heating of Finishing Rolls of Sheel and Tin—By Gordon Fox. 1923—253.
Mills—Electrical Drives for Rolling—By H. C. Uhl. 1925—182.
Mills—Electrical Equipment in Rolling—By Brent Wiley. 1908—Paper 7.

Mills—Electrical Reversing Blooming—By Ralph D. Nye. 1917—351.
Mills—Electrical Rolling—By D. W. Blakeslee. 1925—323.
Mills—Electrically Driven Plate—By G. E. Stoltz. 1918—575.
Mills—Electrically Driven Reversing—By Wilfred Sykes. 1914—667.
Mills—Electrically Driven—By J. T. Sturtevant. 1918—429.
Mills—Electrically Driven Reversing—By J. D. Wright, R. W. Davis and O. H. Needham. 1924—513.
Mills—Electrification of Sheet—By J. S. Murray. 1927—73.
Mills—First Cost and Operating Expenses of Mixed vs. Exclusively Alternating Systems in Steel—By Gano Dunn. 1910—65.
Mills for Its Production—Strip Steel and—By Noble Jones. 1926—40.
Mills from a Safety Standpoint—Bethlehem Steel Company's New Gautier—By J. A. Northwood. 1926—309.
Mills—Fuel Requirements of Steel—By F. E. Leahy. 1921—341.
Mills—Gautier Plant, Cambria Works, Bethlehem Steel Co., Johnstown, Pa.—New Rolling—By R. H. Stevens. 1926—281.
Mills—Herringbone Gears for Steel—By P. C. Day. 1913—295.
Mills—Homestead Steel Works, Carnegie Steel Co., Munhall, Pa.—Electrical Installations, Structural—By C. A. Menk. 1927—214.
Mills—Illumination of Iron and Steel—By G. H. Stickney. 1910—37.
Mills—Inspection Trip of Carnegie Steel Company's McDonald. 1918—219.
Mills in 1929—Application of Electric Drives to Rolling—By J. D. Wright. 1929-30—192.
Mills—Manipulators for Blooming—By L. Iverson. 1926—272.
Mills Manufactured by the Alliance Machine Company—Latest Developments of Electric Cranes for Steel—By E. H. Kendall. 1915—281.
Mills—Methods of Education for Electrical Employes of Iron and Steel—By Educational Committee, A. I. & S. E. E. 1918—303.
Mills—New Developments in Control Apparatus for Steel—By M. A. Whiting. 1911—13.
Mills of the Backed Up Type Remove Cold Rolling Limitations—By Lloyd Jones. 1927—498.
Mills—Orientation of Steel Rod—By G. H. Cole. 1925—194.
Mills—Power Problems in Steel—By Wilfred Sykes. 1912—79.
Mills—Power Transformer Construction for Steel—By G. A. Waters. 1914—391.
Mills—Practical Operation of Motor Driven Continuous—By H. C. Cronk. 1918—35.
Mills—Present Status of Motor Drive for Main Rolls of Steel—By Brent Wiley. 1913—171.
Mills—Purchased Power for Steel—By C. S. Lankton. 1915—193.
Mills—Radical Improvements on Rolling—By J. H. Van Campen. 1927—137.
Mills—Review of Cost of Rolling Steel in Various—By G. E. Stoltz. 1921—105.
Mills—Safety Movement in Steel—By C. M. Brading and F. A. Wiley. 1919—255.
Mills—Selection of Electric Drives for Reversing—By L. A. Umansky. 1925—327.
Mills—Selection of Main Drive Motors for Strip and Skelp—By A. F. Kenyon. 1928-29—190.
Mills—Selection of Motors for Main Drives of Merchant Bar and Rod—By C. B. Huston. 1928-29—160.
Mills—Sheet and Tin—By A. B. Holcomb. 1920—611.
Mills—Sixty Cycles vs. Twenty Five Cycles in Steel—By J. E. Fries. 1918—543.
Mills—Some Economic Considerations in Design of Power Plants for Steel—By T. E. Keating. 1920—455.
Mills—Some Important Phases of Electric Power for Steel—By Charles F. Scott. 1909—Paper 3.
Mills—Special Lighting for Steel—By H. M. Gassman. 1911—160.
Mills—Switchboard and Switching for Steel—By Saul Lavine. 1914—133.
Mills—The Application of Storage Batteries to Iron and Steel—By R. C. Hull. 1908—Paper 10.
Mills—The Application of Synchronous Motors in Steel—By H. A. Winne. 1927—152.
Mills—The Apprenticeship System as Applied to Steel—By B. W. Gilson. 1914—89.
Mills—The Use of Central Station Power Service in Steel—By Jos. McKinley. 1916—505.
Mills—Variable Speed Drives for Main Rolls of Steel—By K. A. Pauly. 1913—267.
Mills—Watthour and Ampere—Hour Meters and Their Applications in Steel—By R. C. Lanphier. 1914—419.
Mine Fans with Synchronous Motors—Reducing Power Bills on—By F. W. Cramer and A. A. MacDonald. 1922—213.
Mine Hoists—Some Factors Entering Into the Selection of Motors for—By F. W. Cramer and A. A. MacDonald. 1923—627.
Mining Equipment, Its Selection, Care and Operation—Electric—By A. F. Elliott. 1924—871.
Mining of Coal—Electricity Applied to the Mechanical—By C. B. Reed. 1919—179.
Mixed vs. Exclusively Alternating Systems in Steel Mills—First Cost and Operating Expenses of—By Gano Dunn. 1910—65.
Mixed Flow Turbines—By M. I. Nusin. 1916—601.
Mixed Gas (Blast Furnace and Coke Oven Gas) on Open Hearth Furnaces at Wisconsin Steel Works—Use of—By G. E. Rose and F. M. Washburn. 1929-30—574.
Mixed Gases—By H. C. Siebert. 1928-29—4.
Mixed Pressure Steam Turbine with Special Reference to the Use of the Steam Regenerator—By E. D. Dickinson. 1912—43.
Mixed Pressure Turbine Equipment, Etc.—Improving Non-Condensing Power Plant by Use of Direct Current—By R. F. Patterson. 1915—153.
Modern Blast Furnace Theory and Practice—By R. H. Sweetser and S. P. Kinney. 1929-30—100.
Modern Cable Construction—Electrolysis and—By W. W. Walsh. 1919—97.
Modern Illuminations in Iron and Steel Industry—By C. E. Clewell. 1912—213.
Modern Plants—High Tension Practice in—By Eugene Vinet. 1929-29—245.
Modern Reversing Mill Drives—By R. H. Wright. 1929-30—374.
Modern Steel Mill Crane Specifications—By F. D. Egan. 1916—745.
Modern Steel Plant—Electrical Features of a—By R. B. Gerhardt. 1920—77.
Modern Structural Industry Demands a Knowledge of Arc Welding—By C. J. Holslag. 1928-29—35.
Modern Trend of Power Development—By Charles P. Steinmetz. 1922—357.
Modern Trends in Stoker Design—By Otto De Lorenzi. 1929-30—61.
Modern Types of Direct Current Machines—The Advantages of—By David Hall. 1916—83.
Modern Types of Steel Mill Cranes—Some—By W. D. Keller. 1927—244.
Molds—New Stripper for Inverted—By F. H. Barnard. 1929-30—14.
Monel Metal—Electrification of the International Nickel Company's Works for—By F. C. Watson. 1922—415.
Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of—By W. H. Himes and R. V. Baud. 1928-29—673.
Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of—By W. H. Himes and R. V. Baud. 1928-29—673.
Motor and Control Applications—New and Interesting Auxiliary—By Phelan McShane. 1926—328
Motor Applications—Synchronous—By James F. Burke. 1925—30.
Motor Bearing Problem—An Analysis of the—By F. W. Cramer. 1927—227.
Motor Control—By M. A. Whiting. 1910—42.
Motor Control—Automatic—By A. C. Eastwood. 1911—25.
Motor Control—Direct Current, A. I. & S. E. E. Junior Division. 1928-29—138
Motor Drive for Main Rolls—Questions on—By E. Friedlaender. 1913—209.

Motor Drive for Main Rolls of Steel Mills—Present Status of—By Brent Wiley. 1913—171.
Motor Drive for Planers—Direct Connected Reversing—By G. W. Richardson. 1911—43.
Motor Drive for Reversing Blooming Mill—Engine vs.—By C. H. Hunt. 1924—547.
Motor Driven Accumulator Pumps—By J. R. Penman. 1923—44.
Motor Driven Auxiliary Apparatus in Steel Mills—Control of—By H. D. James. 1908—Paper 5.
Motor Driven Bloom Shear Without Clutch—By D. W. Dean. 1926—227.
Motor Driven Continuous Mills—Practical Operation of—By H. C. Cronk. 1918—35.
Motor Driven Plate Mill—120 inch.—By W. C. Kennedy. 1923—39.
Motor Driven Rollers—Present Practices in Connection with—By J. C. Dobelbower. 1928-29—177.
Motor Drives—Adjustable Speed—By R. W. Davis. 1923 645.
Motor Field Coils—Direct Current—By R. B. Treat. 1912—125.
Motor—Final Outline Dimensions for A. I. & S. E. Mill Type—By A. C. Cummins, Chairman. Standardization Committee. 1928-29—247.
Motor Generator Sets and Rotary Converters for D. C. Systems—Advantages of—By P. Lincoln. 1907—Paper 14.
Motor Generators—The Parallel Operation of Mercury Arc Rectifiers, with each other, with Rotary Converters and with—By O. K. Marti. 1927—353.
Motor Generators vs. Rotary—Converters—By E. Friedlaender. 1915—57.
Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives Influence of Gear Ration on Speed of Operation—By J. E. Fries. 1919—671.
Motor—New Mill Type—By J. A. Seede. 1907—Paper 5.
Motor Operated Centrifugal Pumps in Steel Plants—By B. A. Cornwell. 1923—309.
Motor—Rollers—By A. M. MacCutcheon. 1928-29—37.
Motor—Standardized Commutating Pole Mill Type—By Standardization Committee, A. I. & S. E. E.—By A. C. Cummins, Chairman. 1926—262.
Motor Starting—Some Recent Developments in Induction—By M. C. Spencer. 1921—277.
Motor, Synchronous Generator, Frequency Changer Equipments—Speed Regulating Induction—By H. C. Uhl. 1926—83.
Motor That Corrects Power Factor—By H. Weischel. 1924—43.
Motor—The Super Synchronous—By H. C. Uhl. 1925—196.
Motors—A Steel Mill Starter for D. C.—By C. V. Pirtle. 1909—Paper 4.
Motors A. C. and D. C. with Controllers—Mill Type—By F. D. Smalley. 1908—Paper 12.
Motors—A. C. Generators and Induction—By E. Heitman. 1907—Paper 8.
Motors—Alternating Current and Direct Current Magnetic Control for Auxiliary—By W. O. Lum. 1914—239.
Motors—Alternating Current Phase Wound Motors vs. Adjustable Speed Direct Current—By D. M. Petty. 1916—719.
Motors—An Automatic Starter for Induction—By H. F. Stratton. 1917—197.
Motors and Controllers—Machine Tool Drives—By H. W. Tice. 1919—1.
Motors and Generators—Carbon Brushes for—By G. M. Little. 1928-29—514.
Motors and Generators—Standard Testing of Direct Current—A. I. & S. E. E. Junior Division. 1928-29—413.
Motors as Applied to Cranes—Control of D.C. and A.C.—By Paul Caldwell. 1916—229.
Motors—Anti-Friction Bearings for Electric—By J. S. Murray. 1928-29—185.
Motors—Continuous Rated or 50 Degree Rise—By L. F. Adams. 1921—21.
Motors—Control Characteristics of Direct Current and Induction—By M. A. Whiting. 1913—37.
Motors—Control Equipments for Auxiliary—By J. D. Wright. 1921—615.
Motors—Cost vs. Upkeep of Direct Current—By A. M. MacCutcheon. 1916—371.
Motors—Crane—By G. W. Richardson. 1909—Paper 2.
Motors—Crocker Wheeler Mill—By Gano S. Dunn. 1908—Paper 14.
Motors for Heavy Torque and Rapid Reversals—Electric—By G. W. Richardson. 1908—Paper 3.
Motors for Main Drives of Merchant, Bar and Rod Mills—Selection of—By C. B. Huston. 1928-29—160.
Motors for Main Roll Drive—General Specifications for A.C.—By Standardization Committee, T. E. Tynes, Chairman. 1919—569.
Motors for Main Roll Drive—Improved Rolling Mill Practice Obtained by the Use of Direct Current—By G. E. Stoltz. 1922—849.
Motors for Main Roll Drives—General Specifications of A.C.—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Chairman. 1921—479.
Motors for Mill Service—Type W—By R. B. Treat. 1907—Paper 9.
Motors for Mine Hoists—Some Factors Entering Into the Selection of—By F. W. Cramer and A. A. MacDonald. 1923—627.
Motors for Overhead Traveling Cranes—Bridge—By R. H. McClain. 1918—347.
Motors for Rolling Mill Drive—The Control of Induction—By Wilfred Sykes and G. E. Stoltz. 1914—357.
Motors for Rolling Mill Table Drives—A.C. vs. D.C.—By W. S. Hall. 1919—419.
Motors for Steel Mill Auxiliaries—Cost and Efficiency of Alternating vs. Direct Current—By B. R. Shover and Edward J. Cheney. 1911—90.
Motors for Steel Mill Drive—Speed Control of Induction—By J. D. Wright. 1916—693.
Motors for Steel Mill Service—Recent Developments of—By Brent Wiley. 1911—82.
Motors for Steel Mills—Auxiliary—By J. D. Wright. 1918—599.
Motors for Strip and Skelp Mills—Selection of Main Drive—By A. F. Kenyon. 1928-29—190.
Motors for the Steel Industry—Standardized—By W. T. Snyder. 1918—99.
Motors—Frog Leg Windings—Direct Current Armature Windings for Multi-Polar Generators and—By W. H. Powell and G. M. Albrecht. 1925—198.
Motors in Parallel When Rigidly Coupled to the Same Load—Operation of Series—By J. A. Jackson. 1927—423.
Motors in Series—Low Speed Motors vs.—By R. B. Treat. 1909—Paper 10.
Motors in Steel Mills—The Application of Synchronous—By H. A. Winne. 1927—152.
Motors in Steel Plants—Heavy Starting and Heavy Duty Direct Current—By G. W. Richardson. 1907—Paper 2.
Motors—Magnetic and Mechanical Control for—By C. T. Henderson. 1907—Paper 12.
Motors—Maintenance of Electric—By N. L. Rea. 1926—288.
Motors—Method of Acceleration of Direct Current Mill Auxiliary—By C. J. Smith. 1926—16.
Motors—Mill—By Gano S. Dunn. 1907—Paper 7.
Motors—Mounting and Maintenance of Roller Bearings in Electric—By U. B. Wachtler. 1924—207.
Motors—Mounting and Maintenance of Roller Bearings on Electric—By D. E. Batesole. 1924—155.
Motors—Overload Protection for—By P. M. Lincoln. 1919—525.
Motors Permanently in Series or Permanently in Parallel—The Operation of Mechanically Connected Direct Current—By H. F. Stratton. 1916—655.
Motors—Reducing Power Bills on Mine Fans with Synchronous—By F. W. Cramer and A. A. MacDonald. 1922—213.
Motors—Report of Standardization Sub-Committee on—By D. M. Petty, Chairman. 1922—673.
Motors—Report of Sub-Committee on—By D. M. Petty, Chairman. 1921—479.
Motors—Roller Bearings Applied to Mill—By L. J. Hess. 1922—811.
Motors—Special Study Regarding Lubrication of Anti-Friction Bearings on Mill and Crane—A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan, Chairman. 1928-29—701.
Motors—Standardization of Ratings of Large Rolling Mill—By K. A. Pauly. 1918—447.
Motors—Starting Characteristics of Steel Mill Synchronous—By H. H. Angel. 1928-29—539.

Motors—The Application of Roller Bearings to General Electric Co. MD—By C. W. Lange. 1928-29—664.
Motors—The Automatic Control of Synchronous—By J. H. Hall. 1927—427.
Motors—The Auxiliary Control and Automatic Acceleration of Electric—By E. W. Yearsley. 1907—Paper 1.
Motors—Time Current Control for Direct Current—By D. C. Wright. 1929-30—3.
Motors to Continuous Mills—Application of Synchronous—By F. O. Schnure. 1925—86.
Motors to Main Roll Drives—The Application of Direct Current—By H. A. Winne. 1927—95.
Motors to Reversing and Non-Reversing Rolling Mills—Application of Large—By K. A. Pauly. 1907—Paper 4.
Motors—Transmission, Illumination, Cranes, Control, Prime Movers and—Report of Standardization Committee for 1918—495.
Motors vs. Adjustable Speed Direct Current Motors—Alternating Current Phase Wound—By D. M. Petty. 1916—719.
Motors vs. Motors in Series—Low Speed—By R. B. Treat. 1909—Paper 10.
Motors with Dynamic Braking and Regenerative Braking—Grab Bucket Coal Hoists Operated by Alternating Current—By James Farrington and R. H. McClain. 1917—439.
Motors with Fly Wheels—Automatic Speed Regulating Equipment for Induction—By E. J. Cheney. 1912—115.
Mounting and Maintenance of Roller Bearings in Electric Motors—By U. B. Wachtler. 1924—207.
Mounting and Maintenance of Roller Bearings in Electric Motors—By D. E. Batesole. 1924—155.
Movement and Accident Prevention—General Safety—By A. I. & S. E. E. Safety Committee, H. A. Shultz, Chairman. 1917—45.
Movement in Steel Mills—Safety—By C. M. Brading and F. A. Wiley. 1919—255.
Movers for Central Stations: Their Economic Relations—Prime—By Edwin D. Dreyfus. 1911—138.
Multax Lamps—The Fox—By J. J. Batterman. 1910—61.
Multi-Polar Generators and Motors—Frog Leg Windings—Direct Current Armature Windings—By W. H. Powell and G. M. Albrecht. 1925—198.
Multi-Speed Drives. 1929-30—235.
Mutually Helpful—How the Electrical Engineer and the Safety Engineer can be—By J. A. Oartel. 1925—220.

N

National Progress—The Engineer and His Relation to—By M. J. Conway. 1929-30—280.
National Tube Company, Gary, Ind.—Electrical Distributing System and Equipment of the—By Edwin L. Upp. 1928-29—55.
Natural Electricity and Lightning Protection—By J. Slepian. 1926—32.
Necks—Anti-Friction Bearings for Roll—By J. H. Van Campen. 1928-29—250.
Necks—Application of Anti-Friction Bearings to Roll and Pinion—By D. M. Petty. 1928-29—288.
Necks—A. I. & S. E. E. Questionnaire Anti-Friction Bearings for Use on Roll and Pinion. 1928-29—80.
Necks—Factors Governing the Design of Roller Bearings For Roll—By F. H. Buhlmann. 1927—208.
Necks of Rolling Mills—and Pinion Stands—Application of Tapered Roller Bearing on Roll—By Fred Waldorf. 1927—178.
Necks of Rolling Mills—Anti-Friction Bearings on Roll—By E. C. Gainsborg. 1927—184.
Necks of Steel Mills—Application of Anti-Friction Bearings to Roll—By E. C. Gainsborg. 1927—36.
Neutral—Experience in the Steel Industry with Grounded—By A. C. Cummins. 1928-29—104.
Neutral—Experience of a Public Utility with Grounded—By G. S. Humphrey. 1928-29—98.
Neutral—for D.C. Distribution Systems—Grounding the—By W. H. Price. 1919—305.
Neutral—Grounded—By Robert Treat. 1920—187.
Neutral—Grounding the—By E. D. Sibley. 1925—191.
Neutral on the Efficiency of Lightning Protection Equipment—The Effect of Grounded—By K. B. McEachron. 1928-29—95.
New and Interesting Auxiliary Motor and Control Applications—By Phelan McShane. 1926—328.
New Apparatus and Appliances—Latest Developments in—By Electrical Developments Committee, A. I. & S. E. E., W. T. Snyder, Chairman. 1916—533.
New Blast Furnace Power Plant, Fairfield Works, Tennessee Coal Iron and Railroad Company—By J. M. Sprague. 1928-29—721.
New Employee in Safety—Instructing the—By A. C. Germain. 1929-30—180.
New Employee in Safety—Instructing the—By H. G. Hensel. 1929-30—180.
New Market for Rolling Mill Shapes—Arc Welding and the—By J. F. Lincoln. 1928-29—81.
New Methods and Practices in Selling Steel—By J. W. Donner. 1928-29—603.
New Mill Type Motor—By J. A. Seede. 1907—Paper 5.
New Production—By S. S. Wales. 1926—XII.
New Resistance Grid Interlocking Systems—Controlling Apparatus at Gary—By C. T. Henderson. 1908—Paper 8.
New Rolling Mills, Gautier Plant, Cambria Works, Bethlehem Steel Co., Johnstown, Pa.—By R. H. Stevens. 1926—281.
New Stripper for Inverted Molds—By F. H. Barnard. 1929-30—14.
New Types of Soaking Pit Cranes—By E. H. Kendall. 1907—Paper 6.
Niagara—Reminiscences of—By P. M. Lincoln. 1916—487.
Non-Condensing Power Plant by Use of Direct Current, Mixed Pressure Turbine Equipment, Etc.—Improving—By R. F. Patterson. 1915—153.
Non-Ferrous Mill Drives—Aluminum, Copper, Brass and. 1929-30—229.
Non-Metallic Gears in the Steel Mill Industry—Micarta—By T. C. Roantree. 1928-29—407.
Non-Reversing Rolling Mills—Application of Large Motors to Reversing and—By K. A. Pauly. 1907—Paper 4.
Normalizing Furnaces—Fuel for Continuous—By J. W. Jones. 1928-29—696.
Notchbacks—Slip Regulators vs.—By Gordon Gage. 1920—653.
Notes on the Damping Down and Restarting of Blast Furnaces—By C. S. Gill. 1929-30—80.
Notes on the Present Status of Electric Furnaces—By Wilfred Sykes. 1913—283.

O

Objects and Scope of the A. I. & S. E. E.—By W. T. Snyder. 1916—469.
Observations on Rolling Mill Drives in Continental Europe—By O. Needham. 1925—187.
Obsolete Equipment—Replacement of—By A. J. Standing. 1927—133.
Obtained by the Use of Direct Current Motors for Main Roll Drive—Improved Rolling Mill Practice—By G. E. Stoltz. 1922—849.
Ode From the Open Hearth—An—By M. J. Conway. 1928-29—361.
Oil—A Recuperator Unit for Industrial Furnaces Burning—By A. E. Walden. 1928-29—281.
Oil—Centrifugal Purification of—By H. T. Moore. 1928-29—331.
Oil Circuit Breakers—Selection and Maintenance of—By M. J. Wohlgemuth and E. K. Read. 1925—288.
Oil Circuit Breakers—The Selection and Maintenance of—By G. A. Burnham. 1925—267.
Oil—Deterioration and Maintenance of—By Colby W. Bryden. 1929-30—273.
One Hundred Days Without an Accident—By R. F. Gale. 1928-29—597.
Open Hearth—An Ode from the—By M. J. Conway. 1928-29—361.
Open Hearth Construction—Chief Features of Basic—By M. J. Conway. 1929-30—318.
Open Hearth Furnace—Operation of an—By M. J. Conway. 1929-30—394.
Open Hearth Furnace Regenerators—Insulation of—By L. B. McMillan. 1928-29—199.
Open Hearth Furnaces—Automatic Door Hoist for—By W. H. Burr and H. A. Lewis. 1918—209.
Open Hearth Furnaces—Application of Waste Heat Boilers to—By Thomas R. Tate. 1920—641.
Open Hearth Furnaces at Wisconsin Steel Works—The Use of Mixed Gas (Blast Furnace and Coke Oven Gas) on—By G. E. Rose and F. M. Washburn. 1929-30—574.
Open Hearth Ladle Cranes—Main Hoists for—By W. W. Garrett, Jr. 1919—271.

Open Hearth Roof Construction—By W. J. Harper. 1926—178.
Open Hearth Roof—The Flat Suspended—By A. L. Foell. 1927—139.
Open Hearths—Combustion Control of—By M. J. Conway. 1925—377.
Opening and Closing Receptacles Containing Inflammable Fluid—Automatically—By Walter Greenwood. 1928-29—444.
Operated by Alternating Current Motors with Dynamic Braking and Regenerative Braking—Grab Bucket Coal Hoists—By James Farrington and R. H. McClain. 1917—439.
Operated Central Pumping Station—An Electrically—By F. W. McKee. 1911—125.
Operated Centrifugal Pumps in Steel Plants—Motor—By B. A. Cornwell. 1923—309.
Operated Crane Statistics—1929 Electrically. 1929-30—196.
Operating Characteristics of an Electric Reversing Blooming Mill—By E. S. Jefferies. 1916—309.
Operating Cost Reduction—Engineering Investigation in—By W. W. Garrett. 1927—136.
Operating Data—Electric Heat Treating Furnace—By R. W. Heller. 1927—136.
Operating Engineer—The Value of Records to an—By Ray S. Huey. 1916—343.
Operating Expenses of Mixed vs. Exclusively Alternating Systems in Steel Mills—First Cost and—By Gano Dunn. 1910—65.
Operating Fireless Steam Locomotive in Shuttle Service at a Steel Plant—Performance and Costs of—By C. H. Hunt. 1929-30—82.
Operating Man's Standpoint—Boiler Troubles from the—By C. J. Smith. 1923—343.
Operation and Demonstration—Flaming Arc Lamps: Their—By C. J. Toerring. 1909—Paper 12.
Operation—Electric Mining Equipment, Its Selection, Care and—By A. F. Elliott. 1924—871.
Operation—Gas Producer—By F. E. Leahy. 1926—181.
Operation, Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives—Influence of Gear Ratio on Speed—By J. E. Fries. 1919—671.
Operation of a Steel Plant High Tension System—Rules and Regulations Pertaining to the—By R. M. Hussey. 1928-29—197.
Operation of Air Compressor Plants for Avoidance of Explosions—Installation and—By W. Greenwood. 1927—126.
Operation of An Open Hearth Furnace—By M. J. Conway. 1929-30—394.
Operation of Anti-Friction—Selection, Installation and—By J. R. T. Bell. 1924—193.
Operation of Carbon Brushes—The Selection and—By W. P. Poynton. 1913—9.
Operation of D. C. Generators and D. C. Generators with Synchronons Converters—Parallel—By E. Pragst. 1927—358.
Operation of Electrical Apparatus—Inspection and—By J. A. Morgan and J. J. Booth. 1919—369.
Operation of Electric Cranes—Rules for Safe—By Safety Committee, A. I. & S. E. E. 1918—273.
Operation of Electric Overhead Traveling Cranes—A. I. & S. E. E. Recommendations Covering Rules for the Safe. 1926—89.
Operation of Electric Overhead Traveling Cranes—Safe—By Membership. 1926—56.
Operation of Frequency Changers—The—By L. M. Smith. 1922—773.
Operating of High Tension System—Rules Governing the—1928-29—135.
Operation of High Tension Power—Safe Practices in Connection with the—By A. N. Cartwright. 1927—159.
Operation of High Tension Power—Safe Practices in Connection with the—By T. E. Hughes. 1927—167.
Operation of Mechanically Connected Direct—Current Motors Permanently in Series or Permanently in Parallel—The—By H. F. Stratton. 1916—655.
Operation of Mercury Arc Rectifiers, with each other, with Rotary Converters and with Motor Generators—The Parallel—By O. K. Marti. 1927—353.
Operation of Motor Driven Continuous Mills—Practical—By H. C. Cronk. 1918—35.
Operation of Power Plant at Betty Furnace, Central Alloy Steel Corporation—A Years—By J. D. Donovan. 1927—500.
Operation of Power Transformers—Care and—By J. G. Corrin. 1922—23.
Operation of Series Motors in Parallel When Rigidly Coupled to the Same Load—By J. A. Jackson. 1927—423.
Operation of Static Condensers—Installation and—By P. T. Vanderwaart. 1923—739.
Operation of Stoeckel Induction Drive—Report on—By G. H. Winslow. 1908—Paper 1.
Operation of Stokers and Boilers—Fuel Economy by Co-Operation in Establishing a Better Practice in the—By J. G. Worker. 1917—465.
Operation of Synchronous Converters for Steel Mill Applications—Parallel—By W. B. Shirk. 1927—356.
Operation of the Heroult Electric Arc Furnace—Mechanical and Electrical—By G. W. Richardson. 1916—399.
Operation—Portable Electric Tools in the Steel Industry: Ground them for Safe. By W. M. Runyon. 1928-29—692.
Operation—Power Factor Correction and Its Relation to Plant—By P. T. Vanderwaart. 1921—213.
Operation—Steam Turbine—By L. W. Heller. 1922—723.
Operation—The Control of Boiler—By W. N. Flanagan. 1921—295.
Operation—The Effect of Grounding on the Reliability of Relay—By E. A. Hester and B. M. Jones. 1928-29—102.
Operators and Brakemen—Safety Rules Governing Locomotive Crane—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Operators Manual—Report of Educational Committee for 1921—Crane—By L. F. Galbraith, Ch. 1921—509.
Operators Physical and Mental Requirements—Safe Crane—By C. M. Swindler. 1926—245.
Opposed to Other Makes of Flame Lamps—Points in Favor of the A. B. Lamp as—By G. Frank Slocum. 1910—28.
Order as an Essential for Safety—Good—By J. A. Voss. 1926—242.
Ore Bridge Transverse Control for Protection Against Wind and Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and—By P. R. Canney. 1923—421.
Ore Bridges—Controllers for Ore Unloaders and—By N. L. Mortenson. 1923—1.
Ore Bridges—Direct Current Hoist and Trolley Control for—By N. L. Mortenson. 1924—879.
Ore Handling Costs—By W. H. Burr. 1923—747.
Ore Industry Records Decrease in Output and Value in 1927—Iron. 1928-29—48.
Ore Unloaders and Ore Bridges—Controllers for—By N. L. Mortenson. 1923—1.
Ore Unloaders, Blast Furnaces and Skip Hoists—By D. W. Blakeslee. 1926—317.
Organization—Departmental—By L. H. Mandeville. 1922—797.
Organization—Departmental—By R. F. Gale. 1922—805.
Organization—General Safety Rules—Safety—A. I. & S. E. E. Safety Committee—By F. A. Wiley, Ch. 1922—682.
Organization of the Electrical Department in the Iron and Steel Industry—By Membership, A. I. & S. E. E. 1919—369.
Organized Inspection as an Aid to Crane Maintenance—By T. J. Flaherty. 1929-30—448.
Organized Safety—By Lew R. Palmer. 1914—447.
Organizing Welding in the Steel Plant—By Walter Petry. 1925—21.
Orientation of Steel Rod Mills—By G. H. Cole. 1925—194.
Other Makes of Flame Lamps—Points in Favor of the A. B. Lamp as Opposed to—By G. Frank Slocum. 1910—28.
Our Convention and Exposition—By A. J. Standing. 1928-29—143.
Our Periodical—By R. F. Chaffin. 1925—VII.
Our Twentieth Annual Convention—By R. S. Shoemaker. 1925—VI.
Out—The Electrical Engineer In the Steel Plant and—By F. B. Crosby. 1921—563.
Outdoor Substation Practice and Use of Carbon Tetrachloride Fuses—By Alfred Alsaker. 1919—55.
Outdoor Substations—R. E. Anderson. 1928-29—30.
Output and Value in 1927—Iron Ore Industry Records Decrease in—1928-29—48.

Output in Boiler Rooms—Measurement of Input and—By J. M. Spitzglass. 1924—317.
Ovens—By-Product Coke—By James Farrington. 1917—227.
Overhead Cranes—Hoist Travel Limits on—By Walter Greenwood. 1929-30—359.
Overhead Ground Wires—Transmission Line Insulation and —By W. W. Lewis. 1928-29—301.
Overhead Traveling Crane—Electric—Questionnaire and Answers—A. I. & S. E. E., Special Committee. 1929-30—331.
Overhead Traveling Crane Specifications—A. I. & S. E. E. Electric. 1929-30—520.
Overhead Traveling Crane—10-Ton—By Cleveland Crane & Engr. Co. 1927—483.
Overhead Traveling Cranes—A. I. & S. E. E. Recommendations Covering Rules for the Safe Operation of Electric. 1926—89.
Overhead Traveling Cranes—Bridge Motors for—By R. H. McClain. 1918—347.
Overhead Traveling Cranes—Heavy Duty Steel Mill Service —General Specifications for Electric—By the Crane Standardization Committee of 1921, F. W. Cramer, Ch. 1921—403.
Overhead Traveling Cranes—Safe Operation of Electric— By Membership. 1926—56.
Overload Protection for Motors—By P. M. Lincoln. 1919 —525.
Overload Protection on Cranes—By A. G. Place. 1919—545.
Overvoltages in the Iron and Steel Industry—Protection Against—By H. M. Towne. 1923—49.
Oxy-Acetylene Process—The Accomplishments and Possibilities of the—By M. S. Pumley. 1912—151.
Oxygen and Hydrogen—Simultaneous Production of—By I. H. Levin. 1923—117.
Oxygen on Economy of Fuel and of Time—The Influence of Cheap—By E. A. W. Jeffries. 1921—329.
Oxygen to Ferrous Metallurgy—Some Applications of—By F. W. Davis. 1927—427.
Oxyhydrogen Plant—Automatic Electrolytic—By F. H. Woodhull. 1919—217.

P

Paper on Steel Works—Illumination—Discussion of—By B. R. Shover. 1911—198.
Parallel Operation of D. C. Generators and of D. C. Generators with Synchronous Converters—By E. Pragst. 1927—358.
Parallel Operation of Mercury Arc Rectifiers: With Each Other, With Rotary Converters and with Motor Generators—By O. K. Marti. 1927—353.
Parallel Operation of Synchronous Converters for Steel Mill Applications—By W. B. Shirk. 1927—356.
Parallel—The Operation of Mechanically Connected Direct —Current Motors Permanently in Series or Permanently in—By H. F. Stratton. 1916—655.
Parallel When Rigidly Coupled to the Same Load—Operation of Series Motors in—By J. A. Jackson. 1927—423.
Parts and Renewal Part Records—Renewal—By W. B. Shirk. 1926—293.
Part Records—Renewal Parts and Renewal—By W. B. Shirk. 1926—293.
Patents—By W. R. Coley. 1929-30—560.
Pennsylvania State College—A. I. & S. E. E. and—Electric Heating Conference. 1929-30—281.
Performance and Costs of Operating Fireless Steam Locomotive in Shuttle Service at a Steel Plant—By C. H. Hunt. 1929-30—82.
Performance—Requirements of Lightning Arresters and Factors Effecting Their—By E. D. Tanzer. 1926—29.
Periodical—Our—By R. F. Chaffin. 1925—VII.
Permanently in Parallel—The Operation of Mechanically Connected Direct—Current Motors Permanently in Series or—By H. F. Stratton. 1916—655.
Permanently in Series or Permanently in Parallel—The Operation of Mechanically Connected Direct—Current Motors—By H. F. Stratton. 1916—655.
Pertaining to Operation of a Steel Plant High Tension System—Rules and Regulations—By R. M. Hussey. 1928-29—197.
Phase Wound Motors vs. Adjustable Speed Direct Current Motors—Alternating Current—By D. M. Petty. 1916 —719.
Phases of Electric Power for Steel Mills—Some Important —By Charles F. Scott. 1909—Paper 3.
Phases of Pyrometry and Temperature Control in the Steel Industry—General—By O. Brewer. 1924—11.
Phenomena—Electric Furnace—By E. T. Moore. 1923—569.
Phenomena on the Design and Selection of Alternating Current Equipment—Effect of Transient—By E. G. Merrick. 1928-29—263.
Phosphoric Acid—Manufacture of—By Theodore Swann. 1922—361.
Physical and Chemical Conditions in the Interior of the Blast Furnace—By S. P. Kinney. 1929-30—104.
Physical and Mental Requirements—Safe Crane Operators— By C. M. Swindler. 1926—245.
Physical Conditions of a Steel Mill as a Factor in Safety— By H. W. Darr. 1928-29—282.
Physical Examination to Electrical Work—The Relation of —By S. C. Coey. 1915—319.
Piercing Mill Drives. 1929-30—220.
Pinion Necks—A. I. & S. E. E. Questionnaire Anti Friction Bearings For Use on Roll and—1928-29—80.
Pinion Necks—Application of Anti-Friction Bearings to Roll and—By D. M. Petty. 1928-29—288.
Pinion Stands—Application of Tapered Roller Bearings on Roll Necks of Rolling Mills and—By Fred Waldorf. 1927—178.
Pinions for Mill and Industrial Service—Tool Steel Gears and—By E. S. Sawtelle. 1917—517.
Pit Covers—Soaking—By Louis Ellman. 1928-29—133.
Pit Cranes—New Types of Soaking—By E. H. Kendall. 1907—Paper 6.
Pits—Electrically Heated Soaking—By B. G. Bailey. 1925 —367.
Pittsburgh Railways Company—Electric Repair Shop Practices of the—By L. J. King. 1925—355.
Placement of Men or What the Plant Surgeon Can Do For Safety—By A. W. Colcord. 1928-20—438.
Planers—Direct Connected Reversing Motor Drive for— By G. W. Richardson. 1911—43.
Plant and Out—The Electrical Engineer in the Steel—By F. B. Crosby. 1921—563.
Plant at Betty Furnace, Central Alloy Steel Corp.—A Year's Operation of Power—By J. D. Donovan. 1927— 500.
Plant—Automatic Electrolytic—Oxy—Hydrogen—By F. H. Woodhull. 1919—217.
Plant Auxiliaries—Drives for Power—By F. T. Leilich. 1927—115.
Plant by the Use of Direct Current Mixed Pressure, Turbine Equipment, Etc.—Improving Non-Condensing Power—By R. F. Patterson, 1915—153.
Plant Developments—1928—Steel—By A. F. Kenyon. 1928-29—459.
Plant—Economical Use of Fuel in the Steel—By H. C. Seibert. 1923—661.
Plant—Electrical Features of a Modern Steel—By R. B. Gerhardt. 1920—77.
Plant Expansions—Year 1929—High Spots in Iron and Steel. 1929-30—246.
Plant Generation—Advantages of Central Station Power Over Steel—By D. B. Rushmore. 1916—21.
Plant—Heat Resisting Alloys and Their Use in the Steel— By J. D. Corfield. 1928-29—549.
Plant High Tension System—Rules and Regulations Pertaining to Operation of a Steel—By R. M. Hussey. 1928-29—197.
Plant Installation at Edgar Thomson Works, Carnegie Steel Co.—Recent Boiler—By R. D. Abbis. 1927—191.
Plant Lighting—Steel—By M. H. Morgan. 1929-30—11.
Plant Maintenance by Autogenous Welding—Steel—By Walter Petry. 1921—679.
Plant—New Blast Furnace Power—Fairfield Works—Tennessee Coal and Iron and Railroad Company—By J. M. Sprague. 1928-29—721.
Plant of the Carpenter Steel Co. During the Last Decade —Improvements at the—By E. J. Poole. 1926—9.
Plant of the Wheeling Steel Corp.—Additions to the Rolling Mills at Steubenville—By M. J. Conway. 1926—114.
Plant Operation—Power Factor Correction and Its Relation to—By P. T. Vanderwaart. 1921—213.
Plant—Organizing Welding in the Steel—By Walter Petry. 1925—21.
Plant—Performance and Costs of Operating Fireless Steam Locomotive in Shuttle Service at a Steel Plant—By C. H. Hunt. 1929-30—82.

Plant—Power Generation By Blast Furnace—By O. C. Callow., 1925—101.
Plant Power Generation from Waste Heat and Coal—Steel —By B. H. Greene. 1920—21.
Plant Power Transmission System—Short Circuit Study Applied to a Steel—By R. M. Hussey. 1929-30—31.
Plant Railroad Electrification—Economics of Steel—By O. Needham and D. C. Hershberger. 1926—149.
Plant Railroad—Electrification of the Steel—By R. B. Gerhardt. 1921—535.
Plant Railroad Yard—Some Considerations in the Electrification of the Steel—By R. B. Gerhardt. 1922—461.
Plant Railways—Electrification of Industrial—By D. M. Petty. 1922—153.
Plant—Refractory Problems By-Product Coke—By M. J. Conway. 1926—180.
Plant Surgeon Can Do For Safety—The Placement of Men or What the--By A. W. Colcord. 1928-29—438.
Plant—Underground Transmission in a Steel—By F. D. Egan. 1914—295.
Plants—A Discussion on Refractories For Use in Steel —By M. C. Booze. 1926—171.
Plants—Alternating Current in By-Product—By W. V. Dunn. 1921—249.
Plants—Application of High Duty Worm Gears in Steel— By A. L. Henthorn. 1926—75.
Plants—Direct Current in By-Product—By E. P. Winters. 1921—257.
Plants—Electrical Drives for Steel—By A. F. Kenyon. 1929-30—189.
Plants—Electrical Progress in Steel—By A. L. Reichert. 1928-29—145.
Plants for Avoidance of Explosions—Installation and Operation of Air Compressor—By W. Greenwood. 1927—126.
Plants for Steel Mills—Some Economic Considerations in Design of Power—By T. E. Keating. 1920—455.
Plants—Fuel Gases and Their Use in Iron and Steel—By H. S. Watts. 1922—97.
Plants—Heavy Starting and Heavy Duty D.C. Motors in Steel Plants—By G. W. Richardson. 1907—Paper 2.
Plants—High Tension Practice in Modern—By Eugene Vinet. 1928-29—245.
Plants—Internal Combusion Engines for Power Generation in Steel—By D. M. Petty. 1922—709.
Plants in Connection with Protective Equipment—Relation Between Central Stations and Steel—By B. M. Jones. 1928-29—52.
Plants—Low Pressure Turbines in Steel—By R. C. Muir. 1909—Page 9.
Plants—Motor Operated Centrifugal Pumps in Steel—By B. A. Cornwell. 1923—309.
Plants—Possibilities in Stage Heating and Steam Extraction in Steel Mill Power—By H. T. Watts. 1923—105.
Plants—Power Transmission in Industrial—By K. M. Raynor. 1922—1.
Plants Review—Iron and Steel—By B. R. Shover. 1928-29 —455.
Plants—Steam Turbines in Iron and Steel—By R. C. Muir. 1910—56.
Plants—The Application of the Corduroy Crane to Industrial—By N. P. Farrar. 1928-29—588.
Plants—The Efficient Burning of Fuel and the Use of Waste Gases in Iron and Steel—By W. W. Pettibone. 1922—49.
Plants—The Measurement of Electricity as Applied to Industrial—By H. H. Pratt. 1925—349.
Plants—The Rehabilitation of Steel—By A. L. Reichert. 1927—138.
Plants—Transmission and Distribution of Power in Industrial—By D. M. Petty. 1920—309.
Plastic Arc System of Welding—The—By Alexander Churchward. 1919—603.
Plastic Materials—Theory of Rolling of—By F. G. Gasche. 1929-30—505.
Plate Drives—Sheet and Tin. 1929-30—218.
Plate Mill Drives. 1929-30—217.
Plate Mill—120" Motor Driven—By W. C. Kennedy. 1923—39.
Plate Mills—Electrically Driven—By G. E. Stoltz. 1918— 575.
Points in Favor of the A. B. Lamp as Opposed to Other Makes of Flame Lamps—By G. Frank Slocum. 1910—28.
Polarized Light as a Method of Studying Gear Stresses— The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and—By W. H. Himes and R. V. Baud. 1928-29— 673.
Poles and Towers—Structural Steel—By R. Fleming. 1912 —358.
Poles for Line Construction—Tubular—By W. T. Snyder. 1912—322.
Poles—Reinforced Concrete—By Robert Cummings. 1912 —343.
Portable Electric Tools as Applied to the Iron and Steel Industry—By A. M. Andresen. 1916—447.
Portable Electric Tools in the Steel Industry: Ground Them For Safe Operation—By W. M. Runyon. 1928-29 —692.
Possibilities in Stage Heating and Steam Extraction in Steel Mill Power Plants—By H. T. Watts. 1923—105.
Possibilities of the Oxy-Acetylene Process—The Accomplishments and—By M. S. Pumley. 1912—151.
Power and Reactive Power—Power Factor Correction— Effective—By W. H. Feldmann. 1927—389.
Power Accounting—By W. O. Oschmann. 1917—163.
Power between Steel Mills and Central Stations—Frequency Converters For Interchange of—By Fred J. Schwarz. 1926—79.
Power Bills on Mine Fans with Synchronous Motors— Reducing—By F. W. Cramer and A. A. MacDonald. 1922—213.
Power Cables—Ductless Electric—By C. F. Hood. 1927 —45.
Power—Central Station—By Wm. H. Hornlein. 1917—667.
Power Circuits—Recent Developments in Switching Devices for—By J. N. Mahoney. 1913—77.
Power Costs—By R. L. Baker. 1916—24.
Power Development—Modern Trend of—By Charles P. Steinmetz. 1922—357.
Power—Discussion of the Elements Entering Into the Cost of Producing—By W. B. Skinkle. 1928-29—220.
Power Distribution in the Steel Industry—Electrical—By B. T. Beitman. 1922—793.
Power Economy—By R. M. Fuller. 1929-30—109.
Power Factor Correction and Its Relation to Plant Operation—By P. T. Vanderwaart. 1921—213.
Power Factor Correction and Voltage Regulation—A Synchronous Condenser Installation for—By W. O. Oschmann. 1914—109.
Power Factor Correction, Effective Power and Reactive Power—By W. H. Feldmann. 1927—389.
Power Factor Correction—Some Fundamental Considerations of—By R. A. McCarty. 1918—19.
Power Factor—The Motor that Corrects—By H. Weischel. 1924—43.
Power for Steel Mills—Central Station—By Central Station Power—Committee, A. I. & S. E. E., C. S. Lankton, Ch. 1916—21.
Power for Steel Mills—Purchased—By C. S. Lankton. 1915—193.
Power for Steel Mills—Some Important Phases of Electric—By Charles F. Scott. 1909—Paper 3.
Power Generating Apparatus—Recent Developments in— By P. M. Lincoln. 1915—45.
Power Generation By Blast Furnace Plant—By O. C. Callow. 1925—101.
Power Generation from Waste Heat and Coal—Steel Plant —By B. H. Greene. 1920—21.
Power Generation in Steel Plants—Internal Combustion Engines for—By D. M. Petty. 1922—709.
Power Generation in Steel Mills and Its Relation to Frequency. By D. M. Petty. 1921—199.
Power in Industrial Plants—Transmission and Distribution of—By D. M. Petty. 1920—309.
Power in the Iron and Steel Industry—By B. R. Shover. 1924—639.
Power in the Iron and Steel Industry—Generation or Purchased?—Electric—By Gordon Fox. 1927—134.
Power in the Iron and Steel Industry—The Application of Electric—By W. S. Hall. 1922—127.
Power in the Steel Industry—Factors Relating to the Economical Generation and Use of Electric—By Brent Wiley. 1917—311.
Power Mazda Lamps for Steel Mill Lighting—High Candle By G. H. Stickney. 1914—649.
Power over Steel Plant Generation—Advantages of Central Station—By D. B. Rushmore. 1916—21.

Power Plant at Betty Furnace, Central Alloy Steel Corp.—A Years Operation of—By J. D. Donovan. 1927—500.
Power Plant Auxiliaries—Drives for—By F. T. Leilich. 1927—115.
Power Plant by Use of Direct Current, Mixed Pressure Turbine Equipment Etc.—Improving Non-Condensing—By R. F. Patterson. 1915—153.
Power Plants for Steel Mills—Some Economic Considerations in Design of—By T. E. Keating. 1920—455.
Power Plant—New Blast Furnace—Fairfield Works—Tennessee Coal Iron and Railroad Company—By J. M. Sprague. 1928-29—721.
Power Plants—Possibilities in Stage Heating and Steam Extraction in Steel Mill—By H. T. Watts. 1923—105.
Power Problems in Steel Mills—By Wilfred Sykes. 1912—79.
Power—Protection and Control of Industrial Electric—By C. P. Steinmetz. 1915—15.
Power Rates—Central Station—By E. C. Stone. 1919—223.
Power Rates—Central Station—By G. M. Gadsby. 1919—238.
Power Rectifiers—By J. H. Milliken. 1921—645.
Power—Safe Practices in Connection with the Operation of High Tension—By A. N. Cartwright. 1927—159.
Power—Safe Practices in Connection with the Operation of High Tension—By T. E. Hughes. 1927—167.
Power Service—Conservative Economy in—By D. M. Petty. 1928-29—146.
Power Service in Steel Mills—The Use of Central Station—By Jos. McKinley. 1916—505.
Power Show—The Annual Convention and—By S. S. Wales. 1925—VI.
Power Supply—Improvement in Efficiency of Electric—By C. P. Steinmetz. 1922—691.
Power Supply to Iron and Steel Industry—Central Station—By Joseph McKinley and R. L. Baker. 1917—339.
Power Systems and the Steel Industry—By E. C. Stone. 1922—279.
Power—The Economical Generation of Electrical—By A. B. Clark. 1921—601.
Power—The Electrification of Steel Mills and the Use of Central Station—By Brent Wiley and Wilfred Sykes. 1915—177.
Power to Steel Mills—Application of Central Station—By T. E. Tynes. 1916—41.
Power Transformer Construction for Steel Mills—By G. A. Waters. 1914—391.
Power Transformers—Care and Operation of—By J. G. Corrin. 1922—23.
Power Transmission—By H. B. Vincent. 1919—135.
Power Transmission in Industrial Plants—By K. M. Raynor. 1922—1.
Power Transmission—Silent Chain—By F. L. Morse. 1914—465.
Power Transmission System—Short Circuit Study Applied to a Steel Plant—By R. M. Hussey. 1929-30—31.
Power; Using Waste Heat—The Generation of Electric—By F. O. Schnure. 1925—296.
Practical and Theoretical Considerations in Design of Electrical Arc Welding Apparatus—Some—By Robert E. Kinkhead. 1919—614.
Practical Education of Steel Mill Electricians to Increase Production—By Educational Committee, B. A. Cornwell, Ch. 1920—255.
Practical Installation of Underground Cables—By P. H. Torchio. 1923—269.
Practical Operation of Motor-Driven Continuous Mills—By H. C. Cronk. 1918—35.
Practically Considered—Some Electrical Problems—By B. G. Lamme. 1914—13.
Practice and Some Examples of the Tendency Toward Conservation of Low Grade and Waste Gases—Foreign—By J. C. Hayes. 198-29—695.
Practice and Use of Carbon Tetrachloride Fuses—Outdoor Substation—By Alfred Alsaker. 1919—55.
Practice as Accomplished at Lukens Steel Co.—Improvements in Steam—By G. D. Spackman. 1923—703.
Practice—Coke Dry Quenching—By W. E. Bisler. 1928-29—696.
Practice—Condensers and Condenser Engineering—By D. D. Pendleton. 1918—385.
Practice During 1927—A Brief Review of Electric Iron and Steel Furnace—By W. E. Lewis. 1928-29—5.
Practice—Foreign Steel Mill—By W. H. Burr. 1925—178.
Practice—Foreign Steel Mill—By F. L. Estep. 1925—179.
Practice in Hydraulic Valves—Latest—By David Brownlee. 1927—413.
Practice In Modern Plants—High Tension—By Eugene Vinet. 1928-29—245.
Practice in the Operation of Stokers and Boilers—Fuel Economy by Co-Operation in Establishing a Better—By J. G. Worker. 1917—465.
Practice in 1922—Heine Boiler—By E. R. Fish and Alfred Cotton. 1922—572.
Practice—Modern Blast Furnace Theory and—By R. H. Sweetster and S. P. Kinney. 1929-30—100.
Practice of Lighting Protection—The Theory and—By Q. A. Brackett. 1920—585.
Practice of 1922—Boiler—By R. E. Butler. 1922—561.
Practice Obtained by the Use of Direct Current Motors for Main Roll Drive—Improved Rolling Mill—By G. E. Stoltz. 1922—849.
Practice—Some Electrical Applications in Steel Mill—By D. M. Petty. 1915—233.
Practice—Steel Mill Electrical Repair Shop—By A. J. Standing. 1920—109.
Practice to Arc Welding—Applying the Principles of Steel Mill—By J. B. Austin. 1929-30—499.
Practiced in Europe—Fuel Utilization—By M. J. Conway. 1928-29—590.
Practices—Developments in Electric Maintenance Shop—By A. C. Cummins. 1924—579.
Practices in Connection with Motor Driven Rollers—Present—By J. C. Dobelbower. 1928-29—177.
Practices in Connection with the Operation of High Tension Power—Safe—By A. N. Cartwright. 1927—159.
Practices in Connection with the Operation of High Tension Power—Safe—By T. E. Hughes. 1927—167.
Practices in Foundries—The Correction of Unsafe—By Nelson H. Kyser. 1928-29—409.
Practices in Selling Steel—New Methods and—By J. W. Donner. 1928-29—603.
Practices of the Pittsburgh Railways Company—Electric Repair Shop—By L. J. King. 1925—355.
Practices—Rolling Mill—Germany, Spain, Russia—By F. L. Estep. 1928-29—526.
Practices—Steel Mill High Tension—By F. O. Schnure. 1928-29—182.
Precipitator—On the Mathematical Theory of the Cottrell Electric—By A. W. Simon. 1928-29—535.
Preheated Air for Combustion Purposes—Extending the Heat Cycle in Boiler Rooms by the Use of—By J. G. Worker. 1925—274.
Preheater—The Ljungstrom Air—By B. G. Brolinson. 1924—461.
Present Day Wire Rope Problems—A Discussion of—By J. F. Howe. 1925—168.
Present Practices in Connection with Motor Driven Rollers—By J. C. Dobelbower. 1928-29—177.
Present Status of Electric Arc Welding—The—By A. M. Candy. 1919—627.
Present Status of Electric Furnaces in the Steel Industry—By Electric Furnace Committee, R. D. Nye, Ch. 1919—481.
Present Status of Electric Furnaces—Notes on the—By Wilfred Sykes. 1913—283.
Present Status of Motor Drive for Main Rolls of Steel Mills—By Brent Wiley. 1913—171.
Pressure Above 500 Pounds—Boiler—By J. B. Crane. 1928-29—179.
Pressure Gas Producers—Control of—By W. P. Chandler, Jr. 1924—289.
Pressure Lubrication—High—By F. D. Street. 1928-29—330.
Pressure Regulators at Inland Steel Co.—By C. J. Smith. 1925—305.
Pressure Steam Boilers—High—By D. S. Jacobus. 1923—753.
Pressure Steam Turbine with Special Reference to the Use of the Steam Regenerator—The Mixed—By E. D. Dickinson. 1912—43.
Pressure Turbine Equipment, Etc.—Improving Non-Condensing Power Plant by Use of Direct Current Mixed—By R. F. Patterson. 1915—153.
Pressure Turbines in Steel Plants—Low—By R. C. Muir. 1909—Paper 9.
Prevention—Accident—By W. Greenwood. 1925—46.
Prevention—General Safety Movement and Accident—By A. I. & S. E. E. Safety Committee, H. A. Schultz, Ch. 1917—45.

Prevention—Joliet Works, Illinois Steel Co. Accident—By John Eib. 1928-29—65.
Prevention of Scale Formation by Boiler Water Conditioning—the—By R. E. Hall, Carl Fischer and G. W. Smith. 1924—353.
Price Certitude—What—By D. M. Petty. 1927—138.
Prime Movers and Motors—Transmission, Illumination, Cranes, Control—Report of Standardization Committee for. 1918—495.
Prime Movers for Central Stations; Their Economic Relations—By Edwin D. Dreyfus. 1911—138.
Principle of Surface Contact to Industrial Haulage—The Application of the—By Chas. L. Kinsloe. 1915—441.
Principles in the Extended Utilization of Blast Furnace Gas—Certain—By Owen R. Rice. 1928-29—568.
Principles of Steel Mill Practice to Arc Welding—Applying the—By J. B. Austin. 1929-30—499.
Problem—An Analysis of the Motor Bearing—By F. W. Cramer. 1927—227.
Problem in the Steel Industry—Frequency—By B. G. Lamme. 1921—69.
Problem—Steel Mill Electrical Machinery and the Insulation—By C. E. Skinner. 1924—101.
Problems—A Discussion of Present Day Wire Rope—By J. F. Howe. 1925—168.
Problems By—Product Coke Plant—Refractory—By M. J. Conway. 1926—180.
Problems in Steel Mills—Power—By Wilfred Sykes. 1912—79.
Problems Practically Considered—Some Electrical—By B. G. Lamme. 1914—13.
Problems—Some Steel Mill Crane—By A. J. Standing. 1923—33.
Problems—Steel Mill Lighting—By R. F. Sanner. 1929-30 552.
Proceedings of A. I. & S. E. E. in Connection with the Development of Anti-Friction Bearings in the Iron and Steel Industry—A Review of the. 1929-30—181.
Process of Making Steel—The Bessemer—By John Sullivan. 1921—91.
Process—The Accomplishments and Possibilities of the Oxy-Acetylene—By M. S. Pumley. 1912—151.
Processes—The Metallurgy of Electric Furnace Steel—By L. B. Lindemuth. 1918—609.
Producer in Steel Works—The Slagging—By K. Huessner. 1924—669.
Producer Operation—Gas—By F. E. Leahy. 1926—181.
Producer—The Application of Blast Furnace Gas and Air for Blowing a Gas—By G. R. McDermott. 1925—126.
Producers—Control of Pressure Gas—By W. P. Chandler, Jr. 1924—289.
Producers—Gas—By F. E. Leahy. 1929-30—1.
Producing Power—Discussion of the Elements Entering Into the Cost of—By W. B. Skinkle. 1928-29—220.
Production—and Fuel Consumption—Steel—By E. Kieft. 1926—298.
Production—New—By S. S. Wales. 1926—XII.
Production of Oxygen and Hydrogen—Simultaneous—By I. H. Levin. 1923—117.
Production of Steel and Iron in the Electric Furnace—The—By E. W. Yearsley. 1909—Paper 1.
Production—Practical Education of Steel Mill Electricians to Increase—By Educational Committee, B. A. Cornwell, Ch. 1920—255.
Production—Strip Steel and Mills for Its—By Noble Jones. 1926—40.
Progress in Instruments and Control—By J. W. Jones. 1928-29—654.
Progress in Steel Plants—Electrical—By A. L. Reichert. 1928-29—145.
Progress in the Iron and Steel Industry and the Electric Furnace—By Carl G. Frank. 1915—105.
Progress in the Steel Industry—By W. H. Burr. 1927—134.
Progress Report on Illumination—A—By Ward Harrison and H. H. Madgsick. 1913—241.
Progress—The Engineer and His Relation to National—By M. J. Conway. 1929-30—280.
Proper Combustion for Furnaces—By W. P. Chandler, Jr. 1928-29—14.
Proper Selection of Carbon Brushes—The—By L. A. Heath. 1921—51.
Prosperity—Companionate—By Robert W. Wolcott. 1928-29—454.
Protection Against Wind and Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore Bridge Transverse Control for—By P. R. Canney. 1923—421.
Protection Against Overvoltages in the Iron and Steel Industry—By H. M. Towne. 1923—49.
Protection and Control of Industrial Electric Power—By C. P. Steinmetz. 1915—15.
Protection Equipment—The Effect of Grounded Neutral on the Efficiency of Lightning—By K. B. McEachron. 1928-29—95.
Protection for Motors—Overload—By P. M. Lincoln. 1919—525.
Protection—Lightning—By R. P. Jackson. 1907—Paper 13.
Protection—Natural Electricity and Lightning—By J. Slepian. 1926—32.
Protection of High Tension Insulators from Flashovers—By H. B. Vincent. 1928-29—311.
Protection on Cranes—Overload—By A. G. Place. 1919—545.
Protection—The Theory and Practice of Lightning—By Q. A. Brackett. 1920—585.
Protection on 13,200 V. and 2,400 V. Distribution Lines—Lightning Arrester—By A. R. Wood. 1926—25.
Protective Equipment—Relation Between Central Stations and Steel Plants in Connection with—By B. M. Jones. 1928-29—52.
Public Service Corp. from the Larger Users' Standpoint—By S. S. Wales. 1927—490.
Public Utility with Grounded Neutral—Experience of a—By G. S. Humphrey. 1928-29—98.
Pulverized Coal to Industrial Furnaces—The Application of By W. A. Shoudy. 1928-29—123.
Pulverized Coal to Metallurgical Furnaces—Application of—By W. O. Renkin. 1929-30—19.
Pulverized Firing in Steam Generation—By F. J. Crolius. 1921—161.
Pumping Station—An Electrically Operated Central—By F. W. McKee. 1911—125.
Pumps in Steel Plants—Motor Operated Centrifugal—By B. A. Cornwell. 1923—309.
Pumps—Motor Driven Accumulator—By J. R. Penman. 1923—44.
Pumps with Automatic Equipment—Centrifugal—By N. C. Bye. 1928-29—279.
Purchase of Coal—Factors Governing the—By Morgan B. Smith. 1928-29—172.
Purchased?—Electric Power in the Iron and Steel Industry—Generation or—By Gordon Fox. 1927—134.
Purchased Power for Steel Mills—By C. S. Lankton. 1915—193.
Purification of Oil—Centrifugal—By H. T. Moore. 1928-29—331.
Purposes—Electric Locomotives for Industrial—By Walter Fixter and Kenneth Andrew. 1919—283.
Purposes—Extending the Heat Cycle in Boiler Rooms by the Use of Preheated Air for Combustion—By J. G. Worker. 1925—274.
Purposes—Liquid Rheostats for Industrial—By Wilfred Sykes. 1910—30.
Pyrometry and Temperature Control in the Steel Industry—General Phases of—By O. Brewer. 1924—11.

Q

Quartz Lamp—The Mercury Vapor—By W. A. D. Evans. 1913—145.
Quenching Practice—Coke Dry—By W. E. Bisler. 1928-29—696.
Quenching of Coke—Dry—By Walter Sennhauser. 1928-29—118.
Questionnaire and Answers—Electric Overhead Traveling Crane, A. I. & S. E. E. Special Committee. 1929-30—331.
Questionnaire: Anti-Friction Bearings for Use on Roll and Pinion Necks—A. I. & S. E. E. 1928-29—80.
Questionnaire—Electric Overhead Traveling Crane Specifications—By R. J. Harry. 1929-30—99.
Questions on Motor Drive for Main Rolls—By E. Friedlaender. 1913—209.

R

Radical Improvements on Rolling Mills—By J. H. Van Campen. 1927—137.
Rail and Structural Mill Drives. 1929-30—216.

Railroad Electrification—Economics of Steel Plant—By O. Needham and D. C. Hershberger. 1926—149.
Railroad—Electrification of the Steel Plant—By R. B. Gerhardt. 1921—535.
Railroad Yard—Some Considerations in the Electrification of the Steel Plant—By R. B. Gerhardt. 1922—461.
Railways—Electrification of Industrial Plant—By D. M. Petty. 1922—153.
Ramifications—By F. W. Crame. 1928-29—639.
Rapid Reversals—Electric Motors for Heavy Torque and —By G. W. Richardson. 1908—Paper 3.
Rated or Fifty Degree Rise Motors—Continuous—By L. F. Adams. 1921—21.
Rates and Contracts—By E. T. Selig. 1916—28.
Rates—Central Station Power—By E. C. Stone. 1919—223.
Rates—Central Station Power—By G. M. Gadsby. 1919—238.
Ratings of Large Rolling Mill Motors—Standardization of —By K. A. Pauly. 1918—447.
Ratio on Speed of Operation—Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives—Influence of Gear—By J. E. Fries. 1919—671.
Reactances—Current Limiting—By R. H. Keil. 1920—481.
Reactive Power—Power Factor Correction Effective Power and—By W. H. Feldmann. 1927—389.
Reading Company—The Maintenance of Locomotive and Rolling Equipment of the—By I. A. Seiders. 1927—29.
Reaming—Electric Drilling and—By F. W. Stevens. 1908 —Paper 2.
Recent Developments at Sparrows Point—By F. O. Schnure. 1928-29—470.
Recent Developments in Automatic Control—By H. P. Townsend. 1917—77.
Recent Developments in Induction Motor Starting—Some— By M. C. Spencer. 1921—277.
Recent Improvements at Gulf States Steel Company—By W. B. Connally. 1928-29—573.
Receptacles Containing Inflammable Fluids—Automatically Opening and Closing—By Walter Greenwood. 1928-29 —444.
Recognition of the Engineer as an Executive—The—By Wray Dudley. 1928-29—475.
Recommendations Covering Rules for the Safe Operation of Electric Overhead Traveling Cranes—A. I. & S. E. E. 1926—89.
Recorder for Steel Mill Service—New Graphic—By H. W. Young. 1910—63.
Recording and Controlling Instruments in the Iron and Steel Industry—By C. C. Eagle and R. M. Walker. 1928-29—205.
Records and Tests—By R B. Gerhardt. 1919—389.
Records Decrease in Output and Value in 1927—Iron Ore Industry. 1928-29—48.
Records to an Operating Engineer—The Value of—By Ray S. Huey. 1916—343.
Records—Renewal Parts and Renewal Part—By W. B. Shirk. 1926—293.
Rectifiers—Power—By J. H. Milliken. 1921—645.
Rectifiers: With Each Other, With Rotary Converters and With Motor Generators—The Parallel Operation of Mercury Arc—By O. K. Marti. 1927—353.
Recuperator—The Chapman—Stein—By W. C. Buell, Jr. 1924—393.
Recuperator Unit for Industrial Furnaces—Burning Oil— By A. E. Walden. 1928-29—281.
Reduced Rolling Costs—Electricity a Factor in—By C. M. Thompson, Jr. 1929-30—112.
Reducing Costs—Electrification as a Means of—By G. E. Stoltz. 1928-29—149.
Reducing Power Bills on Mine Fans with Synchronous Motors—By F. W. Cramer and A. A. MacDonald. 1922—213.
Reducers—Gearless Speed—By H. M. Edmunds. 1929-30 —266.
Reduction—Engineering Investigation in Operating Cost— By W. W. Garrett. 1927—136.
References to Central Stations—Electric Heating with Special—By E. D. Sibley. 1924—799.
Reference to the Use of the Steam Regenerator—The Mixed Pressure Steam Turbine with Special—By E. D. Dickinson. 1912—43.
Refining of Ferrous Metals—Selection of Electrical Equipment for Arc Furnaces Used in the Melting and—By Samuel Arnold, III. 1928-29—487.
Refractories for Use in Steel Plants—A Discussion on— By M. C. Booze. 1926—171.
Refractories—Utility of—By American Refractories Institute. 1927—130.
Refractory Problems By-Product Coke Plant—By M. J. Conway. 1926—180.
Regarding Lubrication of Anti-Friction Bearings on Mill and Crane Motors—Special Study—A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan, Ch. 1928-29—701.
Regenerative Braking—Grab Bucket Coal Hoists Operated by Alternating Current Motors with Dynamic Braking and—By James Farrington and R. H. McClain. 1917—439.
Regenerator—The Mixed Pressure Steam Turbine with Special Reference to the Use of the Steam—By E. D. Dickinson. 1912—43.
Regenerators—The Insulation of Open Hearth Furnace— By L. B. McMillan. 1928-29—199.
Regulating Equipment for Induction Motors with Fly Wheels—Automatic Speed—By E. J. Cheney. 1912—115.
Regulating Induction Motor Synchronous Generator— Frequency Changer Equipments—Speed—By H. C. Uhl. 1926—83.
Regulating Storage Battery as Applied to Steel Works— The—By F. H. Woodhull. 1911—130.
Regulation—A Synchronous Condenser Installation for Power Factor Correction and Voltage—By W. O. Oschmann. 1914—109.
Regulation—Combustion Control and—By J. F. Shadgen. 1928-29—50.
Regulation of Alternating Current Generators—A. I. & S. E. E., Junior Division. 1929-30—163.
Regulation of the Main Roll Drives Speed—By L. A. Umansky. 1927—103.
Regulations Pertaining to Operation of a Steel Plant High Tension System—Rules and—By R. M. Hussey. 1928-29—197.
Regulator or Rheostat—The Liquid Slip—By D. M. Petty. 1923—485.
Regulators at Inland Steel Co.—Pressure—By C. J. Smith. 1925—305.
Regulators vs. Notchbacks—Slip—By Gordon Gage. 1920 —653.
Rehabilitation of Steel Plants—The—By A. L. Reichert. 1927—138.
Rehabilitation—The Superintendent's and Foreman's Responsibility in Safety and—By J. D. Donovan. 1927 —135.
Reinforced Concrete Poles—By Robert Cummings. 1912 343.
Relating to the Economical Generation and Use of Electric Power in the Steel Industry—Factors—By Brent Wiley. 1917—311.
Relation Between Central Stations and Steel Plants in Connection with Protective Equipment—By B. M. Jones. 1928-29—52.
Relation of Physical Examination to Electrical Work—The —By S. C. Coey. 1915—319.
Relation of the Engineer to Fuel Conservation—By J. W. Hays. 1922—395.
Relation to Accident Hazard—Standardization of Electrical Equipment and Its—By W. Greenwood. 1920—297.
Relation to Frequency—Power Generation in the Steel Mills and Its—By D. M. Petty. 1921—199.
Relation to National Progress—The Engineer and His— —By M. J. Conway. 1929-30—280.
Relation to Plant Operation—Power Factor Correction and Its—By P. T. Vanderwaart. 1921—213.
Relation to Safety—Illumination in—By D. W. Blakeslee. 1928-29—6.
Relation to Steel Making—Wire Rope and Its—By James F. Howe. 1915—113.
Relations—Prime Movers for Central Stations—Their Economic—By Edwin D. Dreyfus. 1911—138.
Relative Efficiency of Insulation of 220 and 440 Volt Apparatus—By C. E. Skinner. 1907—Paper 17.
Relay in Vari-Time Control—The Invisible—By W. H. Williams, L. A. Watson and C. H. Rippl. 1928-29—270.
Relay Operation—The Effect of Grounding on the Reliability of—By E. A. Hester and B. M. Jones. 1928-29—102.
Reliability of Relay Operation—Effect of Grounding on the —By E. A. Hester and B. M. Jones. 1928-29—102.
Reminiscences of Niagara—By P. M. Lincoln. 1916—487.

Remodeled and Electrified Rod Mill—By S. N. Roberts. 1925—24.
Remote Controlled Sub-Stations—By W. T. Snyder. 1918—479.
Remote Controlled Sub-Stations as Applied to Steel Mills—Automatic and—By J. K. Ostrander. 1922—365.
Remove Cold Rolling Limitations—Mills of the Backed Up Type—By Lloyd Jones: 1927—498.
Renewal Parts and Renewal Part Records—By W. B. Shirk. 1926—293.
Renewal Part Records—Renewal Parts and—By W. B. Shirk. 1926—293.
Repair and Depreciation of Electrical Apparatus—By G. E. Stoltz. 1915—341.
Repair Shop—Electrical—By C. A. Menk. 1919—381.
Repair Shop Practice—Steel Mill Electrical—By A. J. Standing. 1920—109.
Repair Shop Practices of the Pittsburgh Railways Company—Electric—By L. J. King. 1925—355.
Replacement of Obsolete Equipment—By A. J. Standing. 1927—133.
Report Electric Heat Committee A. I. & S. E. E., 1928-29—By G. H. Schaeffer, Ch. 1929-30—67.
Report Electric Welding Committee—By S. S. Wales. 1928-29—690.
Report of Committee on Electric Heat—A. I. & S. E. E.—By G. H. Schaeffer. 1928-29—233.
Report of Control Committee, A. I. & S. E. E., for 1922—By F. W. Cramer, Ch. 1922—621.
Report of Educational Committee, A. I. & S. E. E.—By A. B. Holcomb, Ch. 1919—327.
Report of Educational Committee for 1921—Crane Operators Manual—By L. F. Galbraith, Ch. 1921—509.
Report of Electric Furnace Committee for 1924—By G. H. Schaeffer, Ch. 1924—731.
Report of Electric Heat Committee for 1927—By G. H. Schaeffer, Ch. 1927—186.
Report of Electric Heat Committee for 1925—By G. H. Schaeffer, Ch. 1925—228.
Report of Electric Heat Committee for 1926—A. I. & S. E. E.—By W. P. Chandler, Jr., Chairman. 1926—99.
Report of Electric Developments Committee for 1927—By W. H. Burr. 1927—203.
Report of Electrical Developments Committee, A. I. & S. E. E. Year. 1929-30—By W. H. Burr, Ch. 1929-30—451.
Report of Electrical Developments Committee of A. I. & S. E. E. for 1923—By W. C. Kennedy, Ch. 1923—523.
Report of Electrical Development Committee, A. I. & S. E. E. for 1928-29—By W. H. Burr. 1928-29—605.
Report of Gas Utilization Committee, A. I. & S. E. E.—By W. N. Flanagan. 1928-29—693.
Report of Standardization Committee for 1918—Transmission Illumination, Cranes, Control, Prime Movers and Motors. 1918—495.
Report of Special Bearings Committee of A. I. & S. E. E. for 1923—By D. M. Petty, Ch. 1923—499.
Report of Standardization Committee of A. I & S. E. E. for 1917—By W. T. Snyder, Ch. 1917—533.
Report of Standardization Sub-Committee on Illumination—By H. L. Kirschberg, Ch. 1921—489.
Report of Standardization Sub-Committee on Motors—By D. M. Petty, Ch. 1922—673.
Report of Standardization Sub-Committee on Motors, General Specifications of A. C. Motors for Main Roll Drives—By D. M. Petty, Ch. 1921—479.
Report of Sub-Committee on Control—By F. J. Burd, Ch. 1920—561.
Report of Sub-Committee on Cranes—By E. S. Lammers, Jr. 1920—539.
Report of Sub-Committee on Illumination—By Ward Harrison, Ch. 1920—569.
Report of Sub-Committee on Motors—By D. M. Petty, Ch. 1920—555.
Report of the A. I. & S. E. E. Special Committee on Bearings, 1929-30—By F. D. Egan, Ch.—1929-30—460.
Report of the Electric Furnace Committee for 1921—By E. T. Moore, Ch.—1921—497.
Report of the Standardization Sub-Committee on Transmission—By A. R. Leavitt, Ch. 1922—665.
Report on Illumination—A Progress—By Ward Harrison and H. H. Madgsick. 1913—241.
Report on Operation of Stoeckel Induction Drive—By G. H. Winslow. 1908—Paper 1.
Report Sub-Committee Illumination—A. I. & S. E. E.—By R. G. Bauer. 1922—662.
Report, 1920—Electrical Developments Committee—By E. S. Jefferies. 1920—381.
Report, 1921—Electric Furnace Committee—By E. T. Moore, Ch. 1921—587.
Report 1921—Electrical Development Committee—By R. B. Gerhardt, Ch. 1921—497.
Report, 1922—Electrical Developments Committee—By R. B. Gerhardt, Ch. 1922—605.
Requirements for Safety—General—By Safety Committee United States Steel Corp. 1927—368—463.
Requirements of Lightning Arresters and Factors Effecting Their Performance—By E. T. Tanzer. 1926—29.
Requirements of Safety—Installation of Electrical Equipment to Comply with—By W. Greenwood. 1915—299.
Requirements of Steel Mills—Fuel—By F. E. Leahy. 1921—341.
Requirements of Switching Equipment Due to Increased Service Capacity—Increased—By W. H. Andrew. 1928-29—441.
Requirements—Safe Crane Operators Physical and Mental—By C. M. Swindler. 1926—245.
Research—Lightning Arrester Design and—By H. M. Towne. 1926—301.
Resistance Grid Interlocking Systems—Controlling Apparatus at Gary—New—By C. T. Henderson. 1908—Paper 8.
Resistance Materials—Electrical—By Walter Kennedy. 1921—241.
Resisting Alloys and Their Use in the Steel Plant—Heat—By J. D. Corfield. 1928-29—549.
Responsibility in Safety and Rehabilitation—The Superintendent's and Foreman's—By J. D. Donovan. 1927—135.
Restarting of Blast Furnaces—Notes on the Damping Down and—By C. S. Gill. 1929-30—80.
Results of Boiler Water Conditioning—By R. E. Hall. 1928-29—681.
Reversals—Electric Motors for Heavy Torque and Rapid—By G. W. Richardson. 1908—Paper 3.
Reverse A. C. Two Speed Mill Controller—Full—By E. G. Peterson. 1926—308.
Reversing and Non-Reversing Rolling Mills—Application of Large Motors to—By K. A. Pauly. 1907—Paper 4.
Reversing Blooming Mill Drive—Specification for 40". 1928-29—404.
Reversing Blooming Mill—Engine vs. Motor Drive for—By C. H. Hunt. 1924—547.
Reversing Blooming Mill—Manipulators for Two High—By C. J. Klein. 1926—274.
Reversing Blooming Mill—Operating Characteristics of an Electric—By E. S. Jeffries. 1916—309.
Reversing Blooming Mill, Wisconsin Steel Co.—40"—By F. A. Wiley. 1928-29—58.
Reversing Blooming Mills—Electrical—By Ralph D. Nye. 1917—351.
Reversing Mill Considered from the Standpoint of Tonnage—The Electric—By K. A. Pauly. 1920—415.
Reversing Mill Drives. 1929-30—237.
Reversing Mill Drives—Modern—By R. H. Wright. 1929-30—374.
Reversing Mills—Electrically Driven—By Wilfred Sykes. 1914—667.
Reversing Mills—Electrically Driven—By J. D. Wright, R. W. Davis and O. H. Needham. 1924—513.
Reversing Mills—Selection of Electric Drives for—By L. A. Umansky, 1925—327.
Reversing Motor Drive for Planers—Direct Connected—By G. W. Richardson. 1911—43.
Reversing Rolling Mill Equipment—Automatic Control of—By E. S. Lammers, Jr. 1920—137.
Reversing Rolling Mills—Electric Drives for—By D .M. Petty. 1917—361.
Review Electrical Developments, Iron and Steel Industry—By W. H. Burr. 1928-29—153.
Review—Iron and Steel Plants—By B. R. Shover. 1928-29—455.
Review of Certain Developments in Fuel Burning and Steam Generation During 1928—By Carl Stripe. 1928-29—461.
Review of Cost of Rolling Steel in Various Mills—By G. E. Stoltz. 1921—105.
Review of Electric Iron and Steel Furnace Practice During 1927—W. E. Lewis. 1928-29—5.

Review of Fuel Engineering During 1928—By M. J. Conway. 1928-29—458.
Review of Proceedings of A. I. & S. E. E. in Connection with the Development of Anti—Friction Bearings in the Iron and Steel Industry. 1929-30—181.
Review of Steel Mill Electrification—A—By B. G. Lamme and Wilfred Sykes. 1922—583.
Rheostat—The Liquid Slip Regulator or—By D. M. Petty. 1924—485.
Rheostats for Industrial Purposes—Liquid—By Wilfred Sykes. 1910—30.
Rise Motors—Continous Rated or Fifty Degree—By L. F. Adams. 1921—21.
Rod Mill Drives. 1929-30—220.
Rod Mill Electrification at the South Works of the American Steel and Wire Co., Worcester Mass.—By Roger H. Bryant. 1928-29—429.
Rod Mill—Remodeled and Electrified—By S. N. Roberts. 1925—24.
Rod Mills Orientation of Steel—By G. H. Cole. 1925—194.
Rod Mills—Selection of Motors for Main Drives of Merchant Bar and—By C. B. Huston. 1928-29—160.
Roll and Pinion Necks—A. I. & S. E. E. Questionnaire Anti-Friction Bearings for Use on. 1928-29—80.
Roll and Pinion Necks—Application of Anti-Friction Bearings to—By D. M. Petty. 1928-29—288.
Roll Drive—General Specification for A.C. Motors for Main—By Standardization Committee, T. E. Tynes, Ch. 1919—569.
Roll Drive—Improved Rolling Mill Practice Obtained by the Use of Direct Current Motors for Main—By G. E. Stoltz. 1922—849.
Roll Drive Statistics—1929 Main. 1929-30—197.
Roll Drives—Adjustable Speed Main—By M. H. Morgan. 1928-29—362.
Roll Drives—Factors Involved in the Selection of Direct Connected and Geared Main—By E. A. Hurme. 1925—49.
Roll Drives—General Specifications of A.C. Motors for Main—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Ch. 1921—479.
Roll Drives in the United States and Canada—Main. 1929-30—198.
Roll Drives—Speed Regulation of the Main—By L. A. Umansky. 1927—103.
Roll Drives—The Application of Direct Current Motors to Main—By H. A. Winne. 1927—95.
Roll Necks—Factors Governing the Design of Roller Bearings for—By F. H. Buhlmann. 1927—208.
Roll Necks—Anti Friction Bearings—By J. H. Van Campen. 1928-29—250.
Roll Necks of Rolling Mills and Pinion Stands—Application of Tapered Roller Bearings on—By Fred Waldorf. 1927—178.
Roll Necks of Rolling Mills—Anti-Friction Bearings on—By E. C. Gainsborg. 1927—184.
Roll Necks of Steel Mills—Application of Anti-Friction Bearings to—By E. C. Gainsborg. 1927—36.
Roller Bearing Applications—Topical Discussion—Developments in Ball and—By Membership, A. I. & S. E. E. 1927—9.
Roller Bearings and Their Applicability to Steel Mill Equipment—Tapered—By F. Waldorf. 1929-30—247.
Roller Bearings—Application of Taper—By T. V. Buckwalter. 1924—133.
Roller Bearings Applied to Mill Motors—By L. J. Hess. 1922—811.
Roller Bearings for Roll Necks—Factors Governing the Design of—By F. H. Buhlmann. 1927—208.
Roller Bearings in Electric Motors—Mounting and Maintenance of—By U. B. Wachtler. 1924—207.
Roller Bearings—Introduction Ball and—By D. M. Petty, Ch. Special Bearings Committee, A. I. & S. E. E. 1924—131.
Roller Bearings on Electric Motors—Mounting and Maintenance of—By D. E. Batesole. 1924—155.
Roller Bearings on Roll Necks of Rolling Mills and Pinion Stands—Application of Tapered—By Fred Waldorf. 1927—178.
Roller Bearings to General Electric Co.—M. D. Motors—Application of—By C. W. Lange. 1928-29—664.
Rollers—Motor—By A. M. MacCutcheon. 1928-29—37.
Rollers—Present Practices in Connection with Motor Driven—By J. C. Dobelbower. 1928-29—177.
Rolling Costs—Electricity a Factor in Reduced—By C. M. Thompson, Jr. 1929-30—112.
Rolling Equipment of the Reading Company—The Maintenance of Locomotive and—By I. A. Seiders. 1927—29.
Rolling Limitations—Mills of the Backed Up Type Remove Cold—By Lloyd Jones. 1927—498.
Rolling Mill Analysis—By E. Kieft. 1929-30—438.
Rolling Mill Applications—Flywheels for—By G. E. Stoltz. 1917—721.
Rolling Mill Drive—The Control of Induction Motors for—By Wilfred Sykes and G. E. Stoltz. 1914—357.
Rolling Mill Drives in Continental Europe—Observations on—By O. Needham. 1925—187.
Rolling Mill Equipment—Automatic Control of Reversing—By E. S. Lammers, Jr. 1920—137.
Rolling Mill in 1927—Barton R. Shover. 1928-29—2.
Rolling Mill Machinery—Characteristics of Cold—By J. H. Van Campen. 1928-29—273.
Rolling Mill Motors—Standardization of Ratings of Large—By K. A. Pauly. 1918—447.
Rolling Mill Practice Obtained by the Use of Direct Current Motors for Main Roll Drive—Improved—By G. E. Stoltz. 1922—849.
Rolling Mill Practices—Germany, Spain, Russia—By F. L. Estep. 1928-29—526.
Rolling Mill Shapes—Are Welding and the New Market for—By J. F. Lincoln. 1928-29—81.
Rolling Mill Table Drives—A.C. vs. D.C. Motors for—By W. S. Hall. 1919—419.
Rolling Mills—Adjustable Speed Drives for—By L. A. Umansky. 1924—817.
Rolling Mills and Pinion Stands—Application of Tapered Roller Bearings on Roll Necks of—By Fred Waldorf. 1927—178.
Rolling Mills—Anti-Friction Bearings on Roll Necks of—By E. C. Gainsborg. 1927—184.
Rolling Mills—Application of Large Motors to Reversing and Non-Reversing—By K. A. Pauly. 1907—Paper 4.
Rolling Mills at Steubenville Plant of the Wheeling Steel Corp.—Additions to—By M. J. Conway. 1926—114.
Rolling Mills—Bearings for Use in—By C. J. Klein. 1927—149.
Rolling Mills—Electrical Drives for—By H. C. Uhl. 1925—182.
Rolling Mills—Electric Drives for Reversing—By D. M. Petty. 1917—361.
Rolling Mills—Electrical—By D. W. Blakeslee. 1925—323.
Rolling Mills—Electrical Equipment in—By Brent Wiley. 1908—Paper 7.
Rolling Mills—Gautier Plant, Cambria Works, Bethlehem Steel Co., Johnstown, Pa.—New—By R. H. Stevens. 1926—281.
Rolling Mills in 1929—Application of Electric Drives to—By J. D. Wright. 1929-30—192.
Rolling Mills—Radical Improvements on—By J. H. Van Campen. 1927—137.
Rolling of Plastic Materials—Theory of—By F. G. Gasche. 1929-30—505.
Rolling of Strip Steel—Cold—By H. C. Uhl. 1928-29—106.
Rolling Steel in Various Mills—Review of Cost of—By G. E. Stoltz. 1921—105.
Rolls of Sheet and Tin Mills—Electric Heating of Finishing—By Gordon Fox. 1923—253.
Rolls of Steel Mills—Present Status of Motor Drive for Main—By Brent Wiley. 1913—171.
Rolls of Steel Mills—Variable Speed Drives for Main—By K. A. Pauly. 1913—267.
Rolls—Questions on Motor Drive for Main—By E. Friedlaender. 1913—209.
Roof Construction—Open Hearth—By W. J. Harper. 1926—178.
Roof—The Flat Suspended Open Hearth—By A. L. Foell. 1927—139.
Rooms by the Use of Preheated Air for Combustion Purposes—Extending the Heat Cycle in Boiler—By J. G. Worker. 1925—274.
Rooms—Measurement of Input and Output in Boiler—By J. M. Spitzglass. 1924—317.
Rope and Its Relation to Steel Making—Wire—By James F. Howe. 1915—113.
Rope Problem—A Discussion of Present Day Wire—By J. F. Howe. 1925—168.
Rotary Converters and with Motor Generators—The Parallel Operation of Mercury Arc Rectifiers with each other and with—By O. K. Marti. 1927—363.

Rotary Converters for D.C. Systems—Advantages of Motor Generator Sets and—By P. Lincoln. 1907—Paper 14.
Rotary Converters—Motor—Generators vs.—By E. Friedlaender. 1915—57.
Rules and Regulations Pertaining to Operation of a Steel Plant High Tension System—By R. M. Hussey. 1928-29—197.
Rules for Government of Employees Working on Electrical Equipment—Safety—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Ch. 1919—315.
Rules for Safe Operation of Electric Cranes—By Safety Committee, A. I. & S. E. E. 1918—273.
Rules for the Safe Operation of Electric Overhead Traveling Cranes—A. I. & S. E. E. Recommendations Covering. 1926—89.
Rules Governing Locomotive Crane Operators and Brakemen—Safety—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Rules Governing the Operation of High Tension System. 1928-29—135.
Rules—High Voltage—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—125.
Rules—Machine Shop Safety—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—126.
Rules—Safety Organization—General Safety—A. I. & S. E. E. Safety Committee—By F. A. Wiley, Ch. 1922—682.
Runways—Crane Track Wheels and Crane—By R. J. Harry. 1929-30—324.

S

Safe Crane Operators Physical and Mental Requirements—By C. M. Swindler. 1926—245.
Safe Operation of Electric Cranes—Rules for—By Safety Committee—A. I. & S. E. E. 1918—273.
Safe Operation of Electric Overhead Traveling Cranes—A. I. & S. E. E. Recommendations Covering Rules for the. 1926—89.
Safe Operation of Electric Overhead Traveling Cranes—By Membership. 1926—56.
Safe Operation—Portable Electric Tools in the Steel Industry—Ground them for—By W. M. Runyon. 1928-29 692.
Safe Practices in Connection with the Operation of High Tension Power—By T. E. Hughes. 1927—167.
Safe Practices in Connection with the Operation of High Tension Power—By A. N. Cartwright. 1927—159.
Safeguarding Electrical Equipment—By Walter Greenwood. 1917—253.
Safety—A. I. & S. E. E. and—Walter Greenwood. 1928-29—16.
Safety and Rehabilitation—The Superintendents and Foreman's Responsibility in—By J. D. Donovan. 1927—135.
Safety—By-Products of—By J. A. Oartel. 1929-30—409.
Safety Circuits—Their Uses and Construction—Electrical—By W. M. Runyon. 1927—248.
Safety Committee, A. I. & S. E. E.—Rules for Safe Operation of Electric Cranes. 1918—273.
Safety Committee, A. I. & S. E. E.—Safety Organization—General Safety Rules—By F. A. Wiley, Ch. 1922—682.
Safety Committee, A. I. & S. E. E.—Safety Rules for Government of Employees Working on Electrical Equipment—Walter Greenwood, Ch. 1919—315.
Safety Committee Work—Comments on the—By the Safety Committee—W. Greenwood, Ch. 1921—597.
Safety Engineer can be Mutually Helpful—How the Electrical Engineer and the—By J. A. Oartel. 1925—220.
Safety Engineering Course—Should Colleges and Universities Create a—By J. A. Voss. 1929-30—446.
Safety First—By John M. Gull. 1929-30—16.
Safety—General Requirements for—By Safety Committee United States Steel Corp. 1927—368—463.
Safety—General Discussion—By Membership. 1914—625.
Safety—Good Order as an Essential for—By J. A. Voss. 1926—242.
Safety—Illumination in Relation to—D. W. Blakeslee. 1928-29—6.
Safety—Installation of Electrical Equipment to Comply with Requirements of—By W. Greenwood. 1915—299.
Safety—Instructing the New Employee in—By H. G. Hensel. 1929-30—180.
Safety—Instructing the New Employee in—By A. C. Germain. 1929-30—180.
Safety in Electric Station Design—The Incorporation of—By V. R. Bacon. 1928-29—615.
Safety in the Design of Standard Apparatus—Consideration of—By C. V. Pirtle. 1910—22.
Safety in the Iron and Steel Industry—Education and—By L. H. Burnett. 1928-29—262.
Safety Limit Stops for Hoists—By D. C. Wright. 1929-30—349.
Safety Movement and Accident Prevention—General—By A. I & S. E. E. Safety Committee, H. A. Schultz, Ch. 1917—45.
Safety Movement in Steel Mills—By C. M. Brading and F. A. Wiley. 1919—255.
Safety—Organized—By Lew R. Palmer. 1914—447.
Safety Organization—General Safety Rules—A. I & S. E. E. Safety Committee—By F. A. Wiley, Ch. 1922—682.
Safety—Physical Conditions of a Steel Mill as a Factor in—By H. W. Darr. 1928-29—282.
Safety Rules for Government of Employees Working on Electrical Equipment—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Ch. 1919—315.
Safety Rules Governing Locomotive Crane Operators and Brakemen, Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—127.
Safety Rules—Machine Shop—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—126.
Safety Rules—Safety Organization—General—A. I. & S. E. E. Safety Committee—By F. A. Wiley, Ch. 1922 682.
Safety Standpoint—Bethlehem Steel Company's New Gautier Mills from a—By J. A. Northwood. 1926—309.
Safety Stimulates Industrial Friendship—By J. A. Voss. 1928-29—469.
Safety Switches—By P. T. Vanderwaart. 1922—873.
Safety—The Big Four of—By J. A. Oartel. 1926—XIII.
Safety—The Future of—By Frank H. Rowe. 1928-29—150.
Safety—The Light for—By Frank R. Fortune. 1911—155.
Safety—The Placement of Men or What the Plant Surgeon Can Do for—By A. W. Colcord. 1928-29—418.
Safety to the Iron and Steel Industry Contribution of—J. A. Oartel. 1928-29—148.
Safety Trophy Award for 1927—Jones and Laughlin—1928-29—51.
Safety Work—The Economic Value of—By L. H. Burnett. 1928-29—134.
Salt Bath Furnaces for Heat Treating—Electric—By A. E. Bellis. 1929-30—311.
Savings in the Iron and Steel Industry—How Electric Industrial Truck and Tractor Equipment is Effecting—By H. J. Payne. 1926—162.
Saws—Direct Connected Hot—By Nelson D .Cooper. 1927—71.
Scale Formation by Boiler Water Conditioning—The Prevention of—By R. E. Hall, Carl Fischer and G. W. Smith. 1924—353.
Scope of the A. I. & S. E. E.—Objects and—By W. T. Snyder. 1916—469.
Screwdown—Mechanical and Electrical Analysis of 40-Inch Blooming Mill—By F. D. Egan. 1924—487.
Screw Downs—Control of Mill Tables and—By W. C. Kennedy. 1920—223.
Section A. I. & S. E. E.—Combustion—By W. P. Chandler, Jr. 1925—VIII.
Sectional Header Boiler—The Modern—By R. M. Rush. 1922—569.
Selecting Electrical Equipment—By L. A. Umansky. 1928-29—633.
Selection and Application of Direct Current Brushes—By R. H. Newton. 1928-29—531.
Selection and Maintenance of Oil Circuit Breaker—By M. J. Wohlgemuth and E. K. Read. 1925—288.
Selection and Maintenance of Oil Circuit Breakers—The—By G. A. Burnham. 1925—267.
Selection and Operation of Carbon Brushes—By W. P. Poynton. 1913—9.
Selection and Use of Carbon Brushes—Manufacture—By E. H. Martindale. 1917—399.
Selection, Care and Operation—Electric Mining Equipment, Its—By A. F. Elliott. 1924—871.
Selection, Installation and Operation of Anti-Friction Bearings—By J. R. T. Bell. 1924—193.
Selection of Alternating Current Equipment—Effect of Transient Phenomena on the Design and—By E. G. Merrick. 1928-29—263.
Selection of Carbon Brushes—By G. Williamson. 1928-29—511.
Selection of Carbon Brushes—The Proper—By L. A. Heath. 1921—51.

Selection of Direct Connected and Geared Main Roll Drives —Factors Involved in the—By E. A. Hurme. 1925—49.
Selection of Electric Drives for Reversing Mills—By L. A. Umansky. 1925—327.
Selection of Electrical Equipment for Arc Furnaces Used in the Melting and Refining of Ferrous Metals—By Samuel Arnold, III. 1928-29—487.
Selection of Main Drive Motors for Strip and Skelp Mills—By A. F. Kenyon. 1928-29—190.
Selection of Motors for Main Drives of Merchant, Bar, and Rod Mills—By C. B. Huston. 1928-29—160.
Selection of Motors for Mine Hoists—Some Factors Entering Into the—By F. W. Cramer and A. A. MacDonald. 1923—627.
Selling Steel—Arc Welding is—By John Lincoln. 1928-29 —290.
Selling Steel—New Methods and Practices in—By J. W. Donner. 1928-29—603.
Series—Low Speed Motors vs. Motors in—By R. B. Treat. 1909—Paper 10.
Series Motors in Parallel When Rigidly Coupled to the Same Load—Operation of—By J. A. Jackson. 1927—423.
Series or Permanently in Parallel—The Operation of Mechanically Connected Direct Current Motors Permanently in—By H. F. Stratton. 1916—655.
Service—Apparatus Built by the General Electric Company for Mill—By D. B. Rushmore. 1907—Paper 3.
Service—Application of the Automatic Substation to Steel Mill—By A. F. Ding. 1928-29—490.
Service at a Steel Plant—Performance and Costs of Operating Fireless Steam Locomotive in Shuttle—By C. H. Hunt. 1929-30—82.
Service Capacity—Increased Requirements of Switching Equipment Due to Increased—By W. H. Andrew. 1928-29—441.
Service Conservative Economy in Power—By D. M. Petty. 1928-29—146.
Service Departments to the General Manager—The Value of Efficient—By C. S. Proudfoot. 1982-29—601.
Service—Electric Locomotive for Hot Mill—By David J. Munro. 1927—236.
Service—General Specifications for Electric Overhead Traveling Cranes—Heavy Duty Steel Mill—By the Crane Standardization Committee of 1921, F. W. Cramer, Ch. 1921—403.
Service in Steel Mills—The Use of Central Station Power —By Jos. McKinley. 1916—505.
Service—New Graphic Recorder for Steel Mill—By H. W. Young. 1910—63.
Service—Recent Developments of Motors for Steel Mill—By Brent Wiley. 1911—82.
Service—Tool Steel Gears and Pinions for Mill and Industrial—By E. S. Sawtelle. 1917—517.
Service—Transformers for Steel Mill—By E. Friedlaender. 1911—46.
Service—Type W Motors for Mill—By R. B. Treat. 1907—Paper 9.
Sets—Alternating Current Speed. 1929-30—238.
Sets and Rotary Converters for D.C. Systems—Advantages Of Motor Generator—By P. Lincoln. 1907—Paper 14.
Sets for the Carnegie Steel Co., Upper Union Works, Youngstown, Ohio—Frequency Converter Speed—By G. P. Wilson. 1927—487.
Shapes—Arc Welding and the New Market for Rolling Mill—By J. F. Lincoln. 1928-29—81.
Shear Without Clutch—Motor Driven Bloom—By D. W. Dean. 1926—227.
Sheet and Tin Mills—Electric Heating of Finishing Rolls of—By Gordon Fox. 1923—253.
Sheet and Tin Mills—By A. B. Holcomb. 1920—611.
Sheet and Tin Plate Drives. 1929-30—218.
Sheet Bar and Skelp Mill Drives. 1929-30—234.
Sheet Bar and Skelp Mill at Indiana Harbor—New—By A. E. Beardmore. 1927—238.
Sheet Mill, Youngstown Sheet and Tube Company—Electrical Installations, Brier Hill—By E. F. Rhodes. 1925 —84.
Sheet Mill, Youngstown Sheet and Tube Co.—Heating Furnaces Brier Hill—By Strickland Kneass, Jr.,. 1925 —85.
Sheet Mill of Youngstown Sheet and Tube Co.—Mechanical Installations Brier Hill—By E. L. McElhinney. 1925 —82.
Sheet Mills—Electrification of—By J. S. Murray. 1927—73.
Shop—Electrical Repair—By C. A. Menk. 1919—381.
Shop Practice—Steel Mill Electrical Repair—By A. J. Standing. 1920—109.
Shop Practices—Developments in Electric Maintenance—By A. C. Cummins. 1924—579.
Shop Practices of the Pittsburgh Railways Co.—Electric Repair—By L. J. King. 1925—355.
Shop Safety Rules—Machine—Central Alloy Steel Corp.—By J. D. Donovan. 1929-30—126.
Short Circuit Study Applied to a Steel Plant Power Transmission System—By R. M. Hussey. 1929-30—31.
Should Colleges and Universities Create a Safety Engineering Course—By J. A. Voss. 1929-30—446.
Show—The Annual Convention and Power—By S. S. Wales. 1925—VI.
Shuttle Service at a Steel Plant—Performance and Costs of Operating Fireless Steam Locomotive in—By C. H. Hunt. 1929-30—82.
Silent Chain Power Transmission—By F. L. Morse. 1914 —465.
Simplification—Their Effect Upon the Foundry's Future—Electrification and—By L. W. Egan. 1926—191.
Simultaneous Production of Oxygen and Hydrogen—By I. H. Levin. 1923—117.
Single Bucket Blast Furnace Skip Hoist Characteristics—By A. C. Cummins and A. R. Leavitt. 1923—453.
Sixty Cycles vs. Twenty Five Cycles in Steel Mills—By J. E. Fries. 1918—543.
Skelp Mill at Indiana Harbor—New Sheet Bar and—By A. E. Beardmore. 1927—238.
Skelp Mill Drives—Sheet Bar and. 1929-30—234.
Skelp Mills—Selection of Main Drive Motors for Strip and —By A. F. Kenyon. 1928-29—190.
Skew Type Direct Current Bridges—A System of Coal and Ore Bridge Transverse Control for Protection Against Wind and Skewage Hazards of the—By P. R. Canney. 1923—421.
Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore Bridge Transverse Control for Protection Against Wind and—By P. R. Canney. 1923—421.
Skip and Bell Hoists—Blast Furnace—By A. E. Handy. 1912—15.
Skip Hoist Characteristics—Single Bucket Blast Furnace—By A. C. Cummins and A. R. Leavitt. 1923—453.
Skip Hoists and Bell Hoists—Electric—By H. D. James and F. J. Burd. 1917—17.
Skip Hoists and Bell Hoists for Blast Furnaces—Recent Developments of Electric—By D. L. Lindquist. 1918 —43.
Skip Hoists—Ore Unloaders, Blast Furnaces and—By D. W. Blakeslee. 1926—317.
Skip Hoists—Ward Leonard Control as Applied to Blast Furnace—By E. Anderson. 1928-29—477.
Slagging Producer in Steel Works—The—By K. Huessner. 1924—669.
Slip Regulator or Rheostat—The Liquid—By D. M. Petty. 1923—485.
Slip Regulators vs. Notchbacks—By Gordon Gage. 1920 653.
Smoke Abatement in Industry—By M. J. Conway. 1929-30—114.
Soaking Pit Covers—By Louis Ellman. 1928-29—133.
Soaking Pit Cranes—New Types of—By E. H. Kendall. 1907—Paper 6.
Soaking Pits—Electrically Heated—By B. G. Bailey. 1925 367.
Social Development of the American Iron and Steel Industry—The Economic and—By T. W. Robinson. 1927 477.
South Works of the American Steel and Wire Company, Worcester Mass.—Rod Mill Electrification—at the—By Roger H. Bryant. 1928-29—429.
Spacing of Heavy Capacity Low Voltage Cables—W. H. Boyce. 1928-29—32.
Spares—Storerooms and—By T. E. Tynes. 1919—384.
Sparrows Point—Recent Developments at—By F. O. Schnure. 1928-29—470.
Special Bearings Committee—Report for 1923—By D. M. Petty, Ch. 1923—499.
Special Committee on Bearings—Report of the A. I. & S. E. E.—By F. D. Egan, Ch. 1929-30—460.
Special Committee on Bearings 1928-29—A. I. & S. E. E. Report of the—By F. D. Egan. 1928-28—656.

Special Committee on Bearings—A. I. & S. E. E. Study Regarding Lubrication of Anti-Friction Bearings on Mill and Crane Motors—By F. D. Egan, Ch. 1928-29—701.
Special Lighting for Steel Mills—By H. M. Gassman. 1911—160.
Special Reference to the Use of the Steam Regenerator—The Mixed Pressure Steam Turbine with—By E. D. Dickinson. 1912—43.
Special References to Central Stations—Electric Heating with—By E. D. Sibley. 1924—799.
Specification Guide Forms—Steel Mill Auxiliary Control—A. I. & S. E. E.. 1929-30—170.
Specifications and Guide Forms—By J. J. Booth. 1929-30—179.
Specifications—A. I. & S. E. Electric Overhead Traveling Crane—1929-30—520.
Specifications for A.C. Motors for Main Roll Drive—General—By Standardization Committee, T. E. Tynes, Ch. 1919—569.
Specifications for Electric Overhead Traveling Cranes—Heavy Duty Steel Mill Service—General—By the Crane Standardization Committee of 1921, F. W. Cramer, Ch. 1921—403.
Specifications for Welding Steel Building by Electricity—By Frank P. McKibben. 1929-30—86.
Specifications for 40-Inch Reversing Blooming Mill Drive. 1928-29—404.
Specifications—Modern Steel Mill Crane—By F .D. Egan. 1916—745.
Specifications of A.C. Motors for Main Roll Drives—General—Report of Standardization Sub-Committee on Motors—By D. M. Petty, Ch. 1921—479.
Speed Control of Induction Motors for Steel Mill Drive—By J. D. Wright. 1916—693.
Speed Direct Current Motors—Alternating Current Phase Wound Motors vs. Adjustable—By D. M. Petty. 1916—719.
Speed Drives—Direct Current Adjustable. 1929-30—239.
Speed Drives for Main Rolls of Steel Mills—Variable—By K. A. Pauly. 1913—267.
Speed Drives for Rolling Mills—Adjustable—By L. A. Umansky. 1924—817.
Speed Main Roll Drives—Adjustable—By M. H. Morgan. 1928-29—362.
Speed Motor Drives—Adjustable—By R. W. Davis. 1923—645.
Speed Motors vs. Motors in Series—Low—By R. B. Treat. 1909—Paper 10.
Speed of Operation—Motor Heating and Contactor Wear in Auxiliary Steel Mill Drives—Influence of Gear Ratio on—By J. E. Fries. 1919—671.
Speed Reducers—Gearless—By H. M. Edmunds. 1929-30—266.
Speed Regulating Equipment for Induction Motors with Fly Wheels—Automatic—By E. J. Cheney. 1912—115.
Speed Regulating Induction Motor Synchronous Generator Frequency Changer Equipments—By H. C. Uhl. 1926—83.
Speed Regulation of the Main Roll Drives—By L. A. Umansky. 1927—103.
Speed Sets—Alternating Current. 1929-30—238.
Speed Sets for the Carnegie Steel Company, Upper Union Works, Youngstown, Ohio—Frequency Converter—By G. P. Wilson. 1927—487.
Spring End Trucks for Cranes—By John Minty. 1929-30—59.
Stage Heating and Steam Extraction in Steel Mill Power Plants—Possibilities in—By H. T. Watts. 1923—105.
Standard Apparatus—Consideration of Safety in the Design of—By C. V. Pirtle. 1910—22.
Standard Testing—Direct Current Motors and Generators—A. I. & S. E. E., Junior Division. 1928-29—413.
Standardization as Viewed by a Designing Engineer—Carbon Brush—By A. M. MacCutcheon. 1928-29—507.
Standardization—By Standardization Committee of A. I. & S. E. E., W. T. Snyder, Ch. 1917—103.
Standardization—By Standardization Committee, A. I & S. E. E., W. T. Snyder, Ch. 1916—567.
Standardization—Carbon Brush—By F. W. Cramer. 1928-29—506.
Standardization Committee—A. I. & S. E. E.—W. T. Snyder, Ch.—Standardization. 1917—103.
Standardization Committee—A. I. & S. E. E.—A. C. Cummins, Ch.—Standardized Commutating Pole Mill Type Motor. 1926—262.
Standardization Committee—General Specifications for A. C. Motors for Main Roll Drives—By T. E. Tynes, Ch. 1919—569.
Standardization Committee of A. I. & S. E. E. for 1917—Report of—By W. T. Snyder, Ch. 1917—533.
Standardization Committee Report—By W. T. Snyder, Ch. 1920—539.
Standardization Committee Report for 1918—Transmission, Illumination, Cranes, Control, Prime Movers and Motors. 1918—495.
Standardized Commutating Pole Mill Type Motor—By Standardization Committee, A. I & S. E. E., A. C. Cummins, Ch. 1926—262.
Standardization of Control Diagrams—By O. C. Callow. 1927—139.
Standardization of Electrical Apparatus for Cranes and Machine Tools. By H. Cosden. 1917—663.
Standardization of Electrical Equipment and Its Relation to Accident Hazard—By W. Greenwood. 1920—297.
Standardization of Engines Stops—By W. Greenwood. 1923—355.
Standardization of Ratings of Large Rolling Mill Motors—By K. A. Pauley. 1918—447.
Standardization of Steel Mill Magnetic Control Diagrams. 1929-30—547.
Standardization Sub-Committee on Illumination—Report of—By H. L. Kirschberg, Ch. 1921—489.
Standardization Sub-Committee on Motors—General Specifications of A.C. Motors for Main Roll Drives—Report of—By D. M. Petty, Ch. 1921—479.
Standardization Sub-Committee on Motors—Report of—By D. M. Petty, Ch. 1922—673.
Standardization Sub-Committee on Transmission—Report of the—By A. R. Leavitt, Ch. 1922—665.
Standardized Motors for the Steel Industry—By W. T Snyder. 1918—99.
Standardized Mill Table Controllers—By J. S. Rowan. 1918—169.
Stands—Application of Tapered Roller Bearings on Roll Necks of Rolling Mills and Pinion—By Fred Waldorf. 1927—178.
Standpoint—Bethlehem Steel Company's New Gautier Mills from a Safety—By J. A. Northwood. 1926—309.
Standpoint—Boiler Troubles from the Operating Man's—By C. J. Smith. 1923—343.
Standpoint of Tonnage—The Electric Reversing Mill Considered from the—By K. A. Pauly. 1929—415.
Standpoint—Public Service Corp. from the Larger Users'—By S. S. Wales. 1927—490.
Standpoint—The Electric Furnace from the Electrical—By G. H. Schaeffer. 1918—623.
Starter for D.C. Motors—A Steel Mill—By C. V. Pirtle. 1909—Paper 4.
Starter for Induction Motors—An Automatic—By H. F. Stratton. 1917—197.
Starters—Allen-Bradley Controllers and—By Lynde Bradley. 1909—Paper 6.
Starting and Heavy Duty D.C. Motors in Steel Plants—Heavy—By G. W. Richardson. 1907—Papers 2.
Starting Characteristics of Steel Mill Synchronous Motors—By H. H. Angel. 1928-29—539.
Starting—Some Recent Developments in Induction Motor—By M. C. Spencer. 1921—277.
Static Condenser—Installation and Operation of—By P. T. Vanderwaart. 1923—739.
Static Condenser on Steel Mill Loads—The—By R. W. Dudley. 1925—106.
Station—An Electrically Operated Central Pumping—By F. W. McKee. 1911—125.
Station and the Electric Furnace—The Central—By W. H. Cogswell. 1916—45.
Station Design—The Incorporation of Safety in Electric—By V. R. Bacon. 1928-29—615.
Station Development—Generating—By D. B. Rushmore and E. Pragst. 1922—473.
Station Power—Central—By Wm. H. Hornlein. 1917—667.
Station Power for Steel Mills—Central—By Central Station Power Committee, A. I. & S. E. E., C. S. Lankton, Ch. 1916—21.
Station Power over Steel Plant Generation—Advantages of Central—By D. B. Rushmore. 1916—21.
Station Power Rates—Central—By E. C. Stone. 1919—223.

Station Power Rates—Central—By G. M. Gadsby. 1919—238.
Station Power Service in Steel Mills—The Use of Central—By Jos. McKinley. 1916—505.
Station Power Supply to Iron and Steel Industry—Central—By Joseph McKinley and R. L. Baker. 1917—339.
Station Power—The Electrification of Steel Plants and the Use of Central—By Brent Wiley and Wilfred Sykes. 1915—177.
Stations and Steel Plants in Connection with Protective Equipment—Relation Between Central—By B. M. Jones. 1928-29—52.
Stations—Auxiliaries and Auxiliary Drives for Steam Electric Generating—By A. L. Penniman, Jr., and F. W. Quarles. 1925—255.
Stations—Electric Heating with Special Reference to—By E. D. Sibley. 1924—799.
Stations—Their Economic Relations—Prime Movers for Central—By Edwin D. Dreyfus. 1911—138.
Statistical Data—By Brent Wiley. 1916—40.
Statistical Data of Electrical Application in the Iron and Steel Industry in the United States—By R. Tschentscher. 1914—83.
Statistics—1929—Electrically Operated Crane. 1929-30—196.
Statistics—Main Roll Drive—1929. 1929-1930—197.
Status of Arc Welding in the Iron and Steel Industry—Present—By Membership. 1919—603.
Status of Electric Arc Welding—The Present—By A. M. Candy. 1919—627.
Status of Electric Furnaces—Notes on the Present—By Wilfred Sykes. 1913—283.
Status of Electric Furnaces in the Steel Industry—Present—By Electric Furnace Committee, R. D. Nye, Ch. 1919—481.
Status of Motor Drive for Main Rolls of Steel Mills—Present—By Brent Wiley. 1913—171.
Steam Boilers—High Pressure—By D. S. Jacobus. 1923—753.
Steam by Electricity—The Generation of—By P. H. Falter. 1923—231.
Steam Electric Generating Stations—Auxiliaries and Auxiliary Drives for—By A. L. Penniman Jr. ,and F. W. Quarles. 1925—255.
Steam Extration in Steel Mill Power Plants—Possibilities in Stage Heating and—By H. T. Watts. 1923—105.
Steam from Coke Breeze—Generation of—By John Van Brunt. 1925—131.
Steam Generation and Utilization—By L. C. Edgar. 1928-29—697.
Steam Generation During 1928—Review of Certain Developments in Fuel Burning and—By Carl Stripe. 1928-29—461.
Steam Generation—Pulverized Firing in—By F. J. Crolius. 1921—161.
Steam Generation—Waste Heat Utilization for—By G. R. McDermott. 1921—357.
Steam Locomotive in Shuttle Service at a Steel Plant—Performance and Costs of Operating Fireless—By C. H. Hunt. 1929-30—82.
Steam Making—Development in—By Martin Frisch. 1928-29—422.
Steam Practice as Accomplished at Lukens Steel Co.—Improvements in—By G. D. Spackman. 1923—703.
Steam Regenerator—The Mixed Pressure Steam Turbine with Special Reference to the Use of the—By E. D. Dickinson. 1912—43.
Steam Turbine Development—By E. Pragst. 1927—39.
Steam Turbine Operation—By L. W. Heller. 1922—723.
Steam Turbine with Special Reference to the Use of the Steam Regenerator—The Mixed Pressure—By E. D. Dickinson. 1912—43.
Steam Turbines—By Howell Von Blarcom. 1907—Paper 15.
Steam Turbines in Iron and Steel Plants—By R. C. Muir. 1910—56.
Steam vs. Electric Driven Mills—Discussion—By Membership, A. I. & S. E. E. 1920—35.
Steel and Iron in the Electric Furnace—The Production of—By E. W. Yearsley. 1909—Paper 1.
Steel and Mills for Its Production—Strip—By Noble Jones. 1926—40.
Steel—Applications of Iron and—Annual Report of Committee of A. I. E. E. 1928-29—445.
Steel—Arc Welding is Selling—By John Lincoln. 1928-29—290.
Steel Buildings—Arc Welded Structural—By C. G. Watson. 1927—53.
Steel Buildings by Electricity—Specifications for Welding By Frank P. McKibben. 1929-30—86.
Steel Buildings—Detailing of Welded—By E. C. Brown. 1928-29—504.
Steel—Cold Rolling of Strip—By H. C. Uhl. 1928-29—106.
Steel Conductors for Transmission Lines—By H. B. Dwight. 1916—205.
Steel Engineer—Iron and—By A. J. Standing. 1928-29—1.
Steel Engineer—Steel Treating and Its Value to the—By R. F. Crump. 1925—298.
Steel—Evolution of the Application of Electricity to the Manufacture of—By George Walz. 1928-29—151.
Steel Exposition—Twenty Sixth Annual Convention and Iron and—By F. W. Cramer. 1929-30—403.
Steel Furnace Practice During 1927—A Brief Review of Electric Iron and Steel—By W. E. Lewis. 1928-29—5.
Steel Gears and Pinions for Mill and Industrial Service—Tool—By E. Sawtelle. 1917—517.
Steel in Various Mills—Review of Cost of Rolling—By G. E. Stoltz. 1921—105.
Steel Industry—A Review of the Proceedings of the A. I. & S. E. E. in Connection with the Development of Anti-Friction Bearings in the Iron and. 1929-30—181.
Steel Industry—Accident Experience in the Iron and. 1928-29—8.
Steel Industry—and the Electric Furnace—Progress in the Iron and—By Carl G. Frank. 1915—105.
Steel Industry and the Electric Utilities—By Merrill Skinner and F. D. Mahoney. 1924—651.
Steel Industry—Anti-Friction Bearings for Auxiliaries in the Iron and—By E. S. Jefferies. 1928-29—184.
Steel Industry—Apprenticeship and Educational Work in the Iron and—By A. W. Soderberg. 1915—371.
Steel Industry—Automatic Telephones in the—By S. Suekoff. 1915—419.
Steel Industry—Central Station Power Supply to Iron and—By Joseph McKinley and R. L. Baker. 1917—339.
Steel Industry—Education and Safety in the Iron and—By L. H. Burnett. 1928-29—262.
Steel Industry—Electric Arc Welding in the—By W. L. Warner. 1925—1.
Steel Industry—Electric Heat in the Iron and—By R. E. Talley. 1926—14.
Steel Industry—Electric Heating Applied to the—By F. A. Hansen. 1922—837.
Steel Industry—Electrical Hazards in the—By F. W. Cramer. 1926—290.
Steel Industry—Electrical Power Distribution in the—By B. T. Beitman. 1922—793.
Steel Industry—Electricity in the Iron and—By J. C. Reed. 1925—307.
Steel Industry—Electricity's Contribution to the Iron and—1929-30—198.
Steel Industry—Engineering in the—By W. H. Warren. 1928-29—604.
Steel Industry—Factors Relating to the Economical Generation and Use of Electric Power in the—By Brent Wiley. 1917—311.
Steel Industry—Frequency Problem in the—By B. G. Lamme. 1921—69.
Steel Industry—General Phases of Pyrometry and Temperature Control in—By O. Brewer. 1924—11.
Steel Industry—Generation or Purchased?—Electric Power in the Iron and—By Gordon Fox. 1927—134.
Steel Industry—Ground them for Safe Operation—Portable Electric Tools in the—By W. M. Runyon. 1928-29—692.
Steel Industry—How Electric Industrial Truck and Tractor Equipment is Effecting Savings in the Iron and—By H. J. Payne. 1926—162.
Steel Industry in the United States—Statistical Data of Electrical Applications in the Iron and—By R. Tschentscher. 1914—83.
Steel Industry—Modern Illuminations in Iron and—By C. E. Clewell. 1912—213.
Steel Industry—Organization of the Electrical Department in the Iron and—By Membership, A. I. & S. E. E.. 1919—369.
Steel Industry—Portable Electric Tools as Applied to the Iron and—By A. M. Andresen. 1916—447.
Steel Industry—Power in the Iron and—By B. R. Shover. 1924—639.
Steel Industry—Power System and the—By E. C. Stone. 1922—279.

Steel Industry—Present Status of Arc Welding in the Iron and—By Membership. 1919—603.
Steel Industry—Present Status of Electric Furnaces in the —By Electric Furnace Committee, R. D. Nye, Ch. 1919 —481.
Steel Industry—Progress in the—By W. H. Burr. 1927—134.
Steel Industry—Protection Against Overvoltages in the Iron and—By H. M. Towne. 1923—49.
Steel Industry—Recording and Controlling Instruments in the Iron and—By C. C. Eagle and R. M. Walker. 1928-29—205.
Steel Industry—Some Methods of Best Utilizing Electrification in the—By G. E. Stoltz. 1928-29—651.
Steel Industry—Standardized Motors for the—By W. T. Snyder. 1918—99.
Steel Industry—Survey of Lighting and Voltage in the—By S. G. Hibben. 1928-29—732.
Steel Industry—The Application of Electric Power in the Iron and—By W. S. Hall. 1922—127.
Steel Industry—The Contribution of Safety to the Iron and—By John A. Oartel. 1928-29—148.
Steel Industry—The Economic and Social Development of the American Iron and—By T. W. Robinson. 1927—477.
Steel Industry—The Flaming Arc Lamp in the Iron and—By A. T. Baldwin. 1914—491.
Steel Industry—The Future of Electricity in the—By W. H. Burr. 1925—VIII.
Steel Industry—The Incandescent Lamp in the—By Ward Harrison. 1912—185.
Steel Industry Today—The Electrical Engineer in the—By A. J. Standing. 1926—XII.
Steel Industry with Grounded Neutral—Experiences in the —By A. C. Cummins. 1928-29—104.
Steel Lightning Arresters—New Aluminum—By D. B. Rushmore. 1908—Paper 11.
Steel Making—Wire Rope and Its Relation to—By James F. Howe. 1915—113.
Steel Mill—Anti-Friction Bearings in the—By A. M. MacCutcheon. 1921—429.
Steel Mill Applications—Parallel Operation of Synchronous Converters for—By W. B. Shirk. 1927—356.
Steel Mill as a Factor in Safety—Physical Conditions of a—By H. W. Darr. 1928-29—282.
Steel Mill Auxiliary Control Specification Guide Forms, A. I. & S. E. E.. 1929-30—170.
Steel Mill Auxiliaries—Cost and Efficiency of Alternating vs. Direct Current Motors for—By B. R. Shover and Edward J. Cheney. 1911—90.
Steel Mill Auxiliaries—Hydraulic vs. Electric Drive for—By R. B. Gerhardt. 1919—85.
Steel Mill Auxiliaries—Magnetic Control for—By H. H. Angel. 1926—229.
Steel Mill Crane Problems—Some—By A. J. Standing. 1923—33.
Steel Mill Crane Specifications—Modern—By F. D. Egan. 1916—745.
Steel Mill Cranes—Some Modern Types of—By W. D. Keller. 1927—244.
Steel Mill Drive—Speed Control of Induction Motors for —By J. D. Wright. 1916—693.
Steel Mill Drives—1928 Developments in—By J. D. Wright. 1928-29—465.
Steel Mill Drives—Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor Wear in Auxiliary—By J. E. Fries. 1919—671.
Steel Mill Electrical Machinery and the Insulation Problem—By C. E. Skinner. 1924—101.
Steel Mill Electrical Repair Shop Practice—By A. J. Standing. 1920—109.
Steel Mill Electrification—A Review of—By B. G. Lamme and W. Sykes. 1922—583.
Steel Mill Electrification—Indirect Effects of—By S. S. Wales. 1927—132.
Steel Mill Electricians to Increase Production—Practical Education of—By Educational Committee, B. A. Cornwell, Ch. 1920—255.
Steel Mill Equipment—Tapered Roller Bearings and Their Applicability to—By F. Waldorf. 1929-30—247.
Steel Mill High Tension Practices—By F. O. Schnure. 1928-29—182.
Steel Mill Illumination—Some Features of Good—By Ward Harrison. 1911—198.
Steel Mill Illumination—What Change?—Fifteen Years of—By Ward Harrison. 1927—143.
Steel Mill Industry—Micarta Non-Metallic Gears in the—By T. C. Roantree. 1928-29—407.
Steel Mill Industry—Recent Electrical Applications in the—By G. E. Stoltz. 1917—135.
Steel Mill Lighting—High Candle Power Mazda Lamps for —By G. H. Stickney. 1914—649.
Steel Mill Lighting—A. I. & S. E. E., Junior Division—By K. A. Staley. 1928-29—729.
Steel Mill Lighting Problems—By R. F. Sanner. 1929-30—552.
Steel Mill Loads—The Static Condenser on—By R. W. Dudley. 1925—106.
Steel Mill Lubrication—By E. P. Mallison. 1928-29—327.
Steel Mill Machinery—Application of Anti-Friction Bearings to—By G. R. Holmes. 1926—16.
Steel Mill Magnetic Control Diagrams—Standardization of. 1929-30—547.
Steel Mill Maintenance Costs with the Welding Arc—By A. M. Candy. 1925—8.
Steel Mill Power Plants—Possibilities in Stage Heating and Steam Extraction in—By H. T. Watts. 1923—105.
Steel Mill Practice—Foreign—By W. H. Burr. 1925—178.
Steel Mill Practice—Foreign—By F. L. Estep. 1925—179.
Steel Mill Practice—Some Electrical Applications in—By D. M. Petty. 1915—233.
Steel Mill Practice to Arc Welding—Applying the Principles of—By J. B. Austin. 1929-30—499.
Steel Mill Service—Application of the Automatic Substation to—By A. P. Ding. 1928-29—490.
Steel Mill Service—General Specifications for Electric Overhead Traveling Cranes—Heavy Duty—By the Crane Standardization Committee of 1921, F. W. Cramer, Ch. 1921—403.
Steel Mill Service—New Graphic Recorder for—By H. W. Young. 1910—63.
Steel Mill Service—Recent Developments of Motors for—By Brent Wiley. 1911—82.
Steel Mill Service—Transformers for—By E. Friedlaender. 1911—46.
Steel Mill Starter for D.C. Motors—A—By C. V. Pirtle. 1909—Paper 4.
Steel Mill Synchronous Motors—Starting Characteristics of —By H. H. Angel. 1928-29—539.
Steel Mills and Central Stations—Frequency Converters for Interchange of Power Between—By Fred J. Schwarz. 1926—79.
Steel Mills and Foundries—Arc Welding Equipment for—By H. L. Unland. 1919—606.
Steel Mills and Its Relation to Frequency—Power Generation in—By D. M. Petty. 1921—199.
Steel Mills and Other Drives—Flexible Couplings for—By J. J. Serrell. 1923—177.
Steel Mills and the Use of Central Station Power—The Electrification of—By Brent Wiley and Wilfred Sykes. 1915—177.
Steel Mills—Application of Anti-Friction Bearings to Roll Necks of—By E. C. Gainsborg. 1927—36.
Steel Mills—Application of Central Station Power to—By T. E. Tynes. 1916—41.
Steel Mills—Application of Auxiliary Apparatus in Iron and —By S. C. Coey. 1914—183.
Steel Mills—Automatic and Remote Controlled Sub-Stations as Applied to—By J. K. Ostrander. 1922—365.
Steel Mills—Auxiliary Motors for—By J. D. Wright. 1918—599.
Steel Mills—Central Station Power for—By Central Station Power Committee, A. I. & S. E. E., C. S. Lankton, Ch. 1916—21.
Steel Mills—Comparative Value of Fuels in—By H. V. Flagg. 1929-30—367.
Steel Mills—Control of Motor Driven Auxiliary Apparatus in —By H. D. James. 1908—Paper 5.
Steel Mills—Cranes for—By J. Matthewson. 1929-30—28.
Steel Mills—Economics of Electric Drive in—By Wilfred Sykes. 1914—597.
Steel Mills—First Cost and Operating Expenses of Mixed vs. Exclusively Alternating Systems in—By Gano Dunn. 1910—65.
Steel Mills—Fuel Requirements of—By F. E. Leahy. 1921—341.
Steel Mills—Herringbone Gears for—By P. C. Day. 1913 295.
Steel Mills—Illumination of Iron and—By G. H. Stickney. 1910—37.

Steel Mills—Manufactured by the Alliance Machine Company—Latest Developments of Electric Cranes for—By E. H. Kendall. 1915—281.
Steel Mills—Methods of Education for Electrical Employees of Iron and—By Educational Committee, A. I. & S. E. E. 1918—303.
Steel Mills—New Developments in Control Apparatus for—By M. A. Whiting. 1911—13.
Steel Mills—Power Problems in—By Wilfred Sykes. 1912 79.
Steel Mills—Power Transformer Construction for—By G. A. Waters. 1914—391.
Steel Mills—Present Status of Motor Drive for Main Rolls of—By Brent Wiley. 1913—171.
Steel Mills—Purchased Power for—By C. S. Lankton. 1915—193.
Steel Mills—Safety Movement in—By C. M. Brading and F. A. Wiley. 1919—255.
Steel Mills—Sixty Cycles vs. Twenty-Five Cycles in—By J. E. Fries. 1918—543.
Steel Mills—Some Economic Considerations in Design of Power Plants for—By T. E. Keating. 1920—455.
Steel Mills—Some Important Phases of Electric Power for—By Charles F. Scott. 1909—Paper 3.
Steel Mills—Special Lighting for—By H. M. Gassman. 1911—160.
Steel Mills—Switchboard and Switching for—By Saul Lavine. 1914—133.
Steel Mills—The Application of Storage Batteries to Iron and—By R. C. Hull. 1908—Paper 10.
Steel Mills—The Application of Synchronous Motors in—By H. A. Winne. 1927—152.
Steel Mills—The Apprenticeship System as Applied to—By B. W. Gilson. 1914—89.
Steel Mills—The Use of Central Station Power Service in—By Jos. McKinley. 1916—505.
Steel Mills—Variable Speed Drives for Main Rolls of—By K. A. Pauly. 1913—267.
Steel Mills—Watthour and Ampere-Hour Meters and Their Applications in—By R. C. Lanphier. 1914—419.
Steel—New Methods and Practices in Selling—By J. W. Donner. 1928-29—603.
Steel Poles and Towers—Structural—By R. Fleming. 1912—358.
Steel Plant and Out—The Electrical Engineer in the—By F. B. Crosby. 1921—563.
Steel Plant Developments—1928—By A. F. Kenyon. 1928-29—459.
Steel Plant—Economical Use of Fuel in the—By H. C. Seibert. 1923—661.
Steel Plant—Electrical Features of a Modern—By R. B. Gerhardt. 1920—77.
Steel Plant Expansions—Year 1929—High Spots in Iron and. 1929-30—246.
Steel Plant Generation—Advantages of Central Station Power over—By D. B. Rushmore. 1916—21.
Steel Plant—Heat Resisting Alloys and Their Use in the—By J. D. Corfield. 1928-29—549.
Steel Plant High Tension System—Rules and Regulations Pertaining to Operation of a—By R. M. Hussey. 1928-29—197.
Steel Plant Lighting—By M. H. Morgan. 1929-30—11.
Steel Plant Maintenance By Autogenous Welding—By Walter Petry. 1921—679.
Steel Plant—Organizing Welding in the—By Walter Petry. 1925—21.
Steel Plant—Performance and Costs of Operating Fireless Steam Locomotives in Shuttle Service at a—By C. H. Hunt. 1929-30—82.
Steel Plant Power Generation from Waste Heat and Coal—By B. H. Greene. 1920—21.
Steel Plant Power Transmission System—Short Circuit Study Applied to a—By R. M. Hussey. 1929-30—31.
Steel Plant Railroad Electrification—Economies of—By O. Needham and D. C. Hershberger. 1926—149.
Steel Plant Railroad—Electrification of the—By R. B. Gerhardt. 1921—535.
Steel Plant Railroad Yard—Some Considerations in the Electrification of the—By R. B. Gerhardt. 1922—461.
Steel Plant—Underground Transmission in a—By F. D. Egan. 1914—295.
Steel Plants—A Discussion on Refractories for Use in—By M. C. Booze. 1926—171.
Steel Plants—Application of High Duty Worm Gears in—By A. L. Henthorn. 1926—75.
Steel Plants—Electrical Drives for—By A. F. Kenyon. 1929-30—189.
Steel Plants—Electrical Progress in—By A. L. Reichert. 1928-29—145.
Steel Plants—Fuel Gases and Their Use in Iron and—By H. S. Watts. 1922—97.
Steel Plants—Heavy Starting and Heavy Duty D.C. Motors in—By G. W. Richardson. 1907—Paper 2.
Steel Plants in Connection with Protective Equipment—Relation Between Central Stations and—By B. M. Jones. 1928-29—52.
Steel Plants—Internal Combustion Engines for Power Generation in—By D. M. Petty. 1922—709.
Steel Plants—Low Pressure Turbines in—By R. C. Muir. 1909—Paper 9.
Steel Plants—Motor Operated Centrifugal Pumps in—By B. A. Cornwell. 1923—309.
Steel Plants Review—Iron and—By Barton R. Shover. 1928-29—455.
Steel Plants—Steam Turbines in Iron and—By R. C. Muir. 1910—56.
Steel Plants—The Efficient Burning of Fuel and the Use of Waste Gases in Iron and—By W. W. Pettibone. 1922—49.
Steel Plants—The Rehabilitation of—By A. L. Reichert. 1927—138.
Steel Poles and Towers—Structural—By R. Fleming. 1912 358.
Steel Production and Fuel Consumption—By E. Kieft. 1926—298.
Steel Processes—The Metallurgy of Electric Furnace—By L. B. Lindemuth. 1918—609.
Steel Rod Mills—Orientation of—By G. H. Cole. 1925—194.
Steel—The Bessemer Process of Making—By John Sullivan. 1921—91.
Steel—The Electric Furnace for Annealing Treatment and Forging of—By Wirt S. Scott. 1918—193.
Steel Treating and Its Value to the Steel Engineer—By R. F. Crump. 1925—298.
Steel—Uses of Electricity in the Development and Manufacture of Tool—By O. K. Parmiter. 1929-30—293.
Steel Welding—Structural—By Frank P. McKibben. 1929-30—321.
Steel Works—Design of Structures for—By Charles A. Randorf. 1916—427.
Steel Works Illumination—Iron and—By C. J. Mundo. 1911—165.
Steel Works Illumination—Discussion of Paper on—By B. R. Shover. 1911—198.
Steel Works—The Slagging Producer in—By K. Huessner. 1924—669.
Steel Works—The Regulating Storage Battery as Applied to—By F. H. Woodhull. 1911—130.
Steel Works—Trend of Recent Boiler Installations in—By W. B. Skinkle. 1927—1.
Steels—Electric Melting of Alloy—By H. M. German. 1928-29—435.
Steubenville Plant of the Wheeling Steel Corp.—Additions to Rolling Mills at—By M. J. Conway. 1926—114.
Stimulates Industrial Friendship—Safety—By J. A. Voss. 1928-29—469.
Stoeckel Induction Drive—Report on Operation of—By G. H. Winslow. 1908—Paper 1.
Stoker and Their Recent Developments—Topical Discussion. 1922—163.
Stoker Design—Modern Trends in—By Otto De Lorenzi. 1929-30—61.
Stokers and Boilers—Fuel Economy by Co-Operation in Establishing a Better Practice in the Operation of—By J. G. Worker. 1917—465.
Stops—Automatic Engine—By W. Greenwood. 1918—325.
Stops for Hoists—Safety Limit—By D. C. Wright. 1929-30—349.
Stops—Standardization of Engine—By W. Greenwood. 1923—355.
Storage Batteries to Iron and Steel Mills—The Application of—By R. C. Hull. 1908—Paper 10.
Storage Battery as Applied to Steel Works—The Regulating—By F. H. Woodhull. 1911—130.
Storeroom and Spares—By T. E. Tynes. 1919—384.
Straight Tube Boilers—Bent Tube vs.—By W. N. Flanagan. 1922—321.
Strength of Gear Teeth—By E. Kieft. 1926—247.

Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear—By W. H. Himes and R. V. Baud. 1928-29—673.
Strip and Hoop Mill Drive. 1929-30—222.
Strip and Skelp Mills—Selection of Main Drive Motors for —By A. F. Kenyon. 1928-29—190.
Strip Mill, American Steel and Wire Company 10"—By F. A. Snyder and R. H. Wright. 1929-30—128.
Strip Steel and Mills for Its Production—By Noble Jones. 1926—40.
Strip Steel—Cold Rolling of—By H. C. Uhl. 1928-29—106.
Stripper for Inverted Molds—New—By F. H. Barnard. 1929-30—14.
Structures for Steel Works—Design of—By Charles A. Randorf. 1916—427.
Structural Industry Demands a Knowledge of Arc Welding—Modern—By C. J. Holslag. 1928-29—35.
Structural Mill Drives—Rail and. 1929-30—216.
Structural Mills, Homestead Steel Works, Carnegie Steel Company, Munhall, Pa.—Electrical Installations—By C. A. Menk. 1927—214.
Structural Steel Buildings—Arc Welded—By C. G. Watson. 1927—53.
Structural Steel Poles and Towers—By R. Fleming. 1912 —358.
Structural Steel Welding—By Frank P. McKibben. 1929-30—321.
Study Applied to a Steel Plant Power Transmission System—Short Circuit—By R. M. Hussey. 1929-30—31.
Study Regarding Lubrication of Anti-Friction Bearings for Mill and Crane Motors, A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan, Chairman. 1928-29—701.
Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of—By W. H. Himes and R. V. Baud. 1928-29—673.
Substation Practice and Use of Carbon-Tetrachloride Fuses —Outdoor—By Alfred Alsaker. 1919—55.
Substation to Steel Mill Service—Application of the Automatic—By A. P. Ding. 1928-29—490.
Sub-Stations as Applied to Steel Mills—Automatic and Remote Controlled—By J. K. Ostrander. 1922—365.
Substations—Outdoor—By R. E. Anderson. 1928-29—30.
Sub-Stations—Remote Controlled—By W. T. Snyder. 1918 —479.
Super Synchronous Motor—By H. C. Uhl. 1925—196.
Superintendent—The Electrical—By R. M. Hussey. 1928-29—639.
Superintendent's and Foreman's Responsibility in Safety and Rehabilitation—The—By J. D. Donovan. 1927—135.
Supply—Improvement in Efficiency of Electric Power—By C. P. Steinmetz. 1922—691.
Supply to Iron and Steel Industry—Central Station Power —By Joseph McKinley and R. L. Baker. 1917—339.
Surface Combustion and Its Application—By W. M. Hepburn. 1923—537.
Surface Contact to Industrial Haulage—The Application of the Principle of—By Charles L. Kinsloe. 1915—441.
Surfaces and Furnace Walls—Insulation of Hot—By L. B. McMillan. 1925—158.
Surgeon Can Do for Safety—The Placement of Men or What the Plant—By A. W. Colcord. 1928-29—438.
Surveys of Lighting and Voltage in the Steel Industry—By S. G. Hibben. 1928-29—732.
Suspended Open Hearth Roof—The Flat—By A. L. Foell. 1927—140.
Susquehanna Station, Metropolitan Power Company—Design and Test of—By J. A. Powell. 1926—48.
Switch Controllers—Combination Manual and Magnetic—By H. F. Stratton. 1908—Paper 9.
Switch Controllers—Magnetic—By C. V. Pirtle. 1907—Paper 11.
Switchboard and Switching for Steel Mills—By Saul Lavine. 1914—133.
Switches—Safety—By P. T. Vanderwaart. 1922—873.
Switching and Mill Transportation—Yard—By W. B. Potter and G. H. Shapter. 1926—144.
Switching Devices for Power Circuits—Recent Developments in—By J. N. Mahoney. 1913—77.
Switching Equipment Due to Increased Service Capacity—Increased Requirements of—By W. H. Andrew. 1928-29—441.
Switching for Steel Mills—Switchboard and—By Saul Lavine. 1914—133.
Switching Instructions, Electrical Department, Bethlehem Steel Co., Lackawanna Plant. 1928-29—34.
Synchronous Condenser Installation for Power Factor Correction and Voltage Regulation—A—By W. O. Oschmann. 1914—109.
Synchronous Converters for Steel Mill Applications—Parallel Operation—By W. B. Shirk. 1927—356.
Synchronous Converters—Parallel Operation of D.C. Generators and of D.C. Generators with—By E. Pragst. 1927—358.
Synchronous Generator, Frequency Changer Equipments—Speed Regulating Induction Motor—By H. C. Uhl. 1926—83.
Synchronous Motor Applications—By James F. Burke. 1925—30.
Synchronous Motor Drives. 1929-30—235.
Synchronous Motor—The Super—By H. C. Uhl. 1925—196.
Synchronous Motors in Steel Mills—The Application of—By H. A. Winne. 1927—152.
Synchronous Motors—Reducing Power Bills on Mine Fans with—By F. W. Cramer and A. A. MacDonald. 1922 —213.
Synchronous Motors—Starting Characteristics of Steel Mill —By H. H. Angel. 1928-29—539.
Synchronous Motors—The Automatic Control of—By J. H. Hall. 1927—427.
Synchronous Motors to Continuous Mills—Application of—By F. O. Schnure. 1925—86.
Systematizing the Work of an Electrical Engineering Division—By P. T. Vanderwaart. 1923—553.
System and Equipment of the National Tube Co., Gary, Ind.—Electrical Distributing—By Edwin L. Upp. 1928-29—55.
System as Applied to Steel Mills—The Apprenticeship—By B. W. Gilson. 1914—89.
System of Coal and Ore Bridge Traverse Control for Protection Against Wind and Skewage Hazards of Skew Type Direct Current Bridges—By P. R. Canney. 1923 —421.
System of Distribution—Underground—By W. D. Legon. 1912—297.
System of Welding—The Plastic Arc—By Alexander Churchward. 1919—603.
System—Rules and Regulations Pertaining to Operation of a Steel Plant High Tension—By R. M. Hussey. 1928-29—197.
System—Rules Governing the Operation of High Tension. 1928-29—135.
System—Short Circuit Study Applied to a Steel Plant Power Transmission—By R. M. Hussey. 1929-30—31.
Systems—Advantages of Motor Generator Sets and Rotary Converters for D.C.—By P. Lincoln. 1907—Paper 14.
Systems and the Steel Industry—Power—By E. C. Stone. 1922—279.
Systems—Apprentice—By Educational Committee, A. I. & S. E. E., C. A. Menk, Chairman. 1916—615.
Systems—Arc Welding—By A. M. Bennett. 1919—610.
Systems—Controlling Apparatus at Gary—New Resistance Grid Interlocking—By C. T. Henderson. 1908—Paper 8.
Systems—Grounding the Neutral for D.C. Distribution—By W. H. Price. 1919—305.
Systems in Steel Mills—First Cost and Operating Expenses of Mixed vs. Exclusively Alternating—By Gano Dunn. 1910—65.
Systems—Interconnections of Electrical—By N. E. Funk. 1929-30—390.
Systems—Underground Distribution—By G. J. Newton. 1916—171.

T

Table Controllers—Standardized Mill—By J. S. Rowan. 1918—169.
Table Drives—A.C. vs. D.C. Motors for Rolling Mill—By W. S. Hall. 1919—419.
Tables and Screw Downs—Control of Mill—By W. C. Kennedy. 1920—223.
Tables—Temperature Conversion—By American Refractories Institute. 1927—131.
Tangible Advantages of Electric Heat Treatment—The—By Wirt S. Scott. 1929-30—289.
Taper Roller Bearings—Application of—By T. V. Buckwalter. 1924—133.

Tapered Roller Bearings and Their Applicability to Steel Mill Equipment—By F. Waldorf. 1929-30—247.
Tapered Roller Bearings on Roll Necks of Rolling Mills and Pinion Stands—Application—By Fred Waldorf. 1927—178.
Tata Iron Works at Jamshedpur—Electrification of the—By S. Ghosh. 1927—404.
Teeth—Strength of Gear—By E. Kieft. 1926—247.
Telephone Interference—Effect of Grounding on—By J. J. Pilliod. 1928-29—82.
Telephones in the Steel Industry—Automatic—By S. Suekoff. 1915—419.
Temperature Control in the Steel Industry—General Phases of Pyrometry and—By O. Brewer. 1924—11.
Temperature Conversion Tables—By American Refractories Institute. 1927—131.
Temperature Furnace Applications—Medium and Low—By E. A. Hurme. 1924—771.
Temperature Furnace Installations—Medium—By C. F. Cone. 1924—747.
Temperature on the Insulation of Dynamo-Electric Machinery—Effect of—By C. E. Skinner. 1912—287.
Tempering of Coal—The—By T. A. Marsh. 1923—367.
Tendency Toward Conservation of Low Grade and Waste Gases—Foreign Practice and Some Examples of the—By J. C. Hayes. 1928-29—695.
Tennessee Coal Iron and Railroad Company, Fairfield Works, New Blast Furnace Power Plant—By J. M. Sprague. 1928-29—721.
Test of Susquehanna Station, Metropolitan Power Company—Design and—By J. A. Powell. 1926—48.
Testing Direct Current Motors and Generators—Standard—A. I. & S. E. E., Junior Division. 1928-29—413.
Testing of Electrical Apparatus—Factory—A. I. & S. E. E., Junior Division. 1928-29—446.
Tests—Records and—By R. B. Gerhardt., 1919—389.
Tests with an Electrical Bright Annealing Furnace—By E. Schreiber. 1927—379.
Theoretical Considerations in Design of Electrical Arc Welding Apparatus—Some Practical and—By Robert E. Kinkead. 1919—614.
Theory and Practice—Modern Blast Furnace—By R. H. Sweetser and S. P. Kinney. 1929-30—100.
Theory and Practice of Lightning Protection—The—By Q. A. Brackett. 1920—585.
Theory of Grounding—By F. C. Hanker. 1928-29—91.
Theory of Rolling of Plastic Materials—By F. G. Gasche. 1929-30—505.
Theory of the Cottrell Electric Precipitator—On the Mathematical—By A. W. Simon. 1928-29—535.
Thermit Welding—By H. D. Kelly. 1925—5.
Things to Think About—A Few—By F. W. Cramer. 1926—X.
Think About—A Few Things—to—By F. W. Cramer. 1926—X.
Thomas Flexible Coupling—The—By J. H. Albrecht. 1923—206.
Thoughts in Fuel Economy—Future—By J. D. Donovan. 1929-30—408.
Time Control—The Invisible Relay in Vari—By W. H. Williams, L. A. Watson and C. H. Rippl. 1928-29—270.
Time Current Control for Direct Current Motors—By D. C. Wright. 1929-30—3.
Time Limit Control—Inductive—By N. L. Mortenson. 1927—397.
Time—The Influence of Cheap Oxygen on Economy of Fuel and of—By E. A. W. Jefferies. 1921—329.
Tin Mills—Electric Heating of Finishing Rolls of Sheet and—By Gordon Fox. 1923—253.
Tin Mills—Sheet and—By A. B. Holcomb. 1920—611.
Tin Plate Drives—Sheet and. 1929-30—218.
Today—The Electrical Engineer in the Steel Industry—By A. J. Standing. 1926—XII.
Tonnage—The Electric Reversing Mill Considered from the Standpoint of—By K. A. Pauly. 1920—415.
Tool Control—Machine—By H. W. Eastwood. 1914—585.
Tool Drives: Motors and Controllers—Machine—By H. W. Tice. 1919—1.
Tool Steel Gears and Pinions for Mill and Industrial Service—By E. S. Sawtelle. 1917—517.
Tool Steel—Uses of Electricity in the Development and Manufacture of—By O. K. Parmiter. 1929-30—293.
Tools as Applied to the Iron and Steel Industry—Portable Electric—By A. M. Andresen. 1916—447.
Tools in the Steel Industry: Ground them for Safe Operation—Portable Electric—By W. M. Runyon. 1928-29—692.
Tools—Standardization of Electrical Apparatus for Cranes and Machine—By H. Cosden. 1917—663.
Topical Discussion—Recent Developments in Ball and Roller Bearing Applications—By Membership, A. I. & S. E. E. 1927—9.
Topical Discussion: Stokers and Their Recent Developments. 1922—163.
Torque and Rapid Reversals—Electric Motors for Heavy—By G. W. Richardson. 1908—Paper 3.
Towers—Structural Steel Poles and—By R. Fleming. 1912—358.
Track Wheels and Crane Runways—Crane—By R. J. Harry. 1929-30—324.
Track Wheels—Crane—By W. T. Snyder. 1911—72.
Track Wheels—Crane—By E. S. Sawtelle. 1929-30—364.
Tractor Equipment is Effecting Savings in the Iron and Steel Industry—How Electrical Industrial Truck and—By H. J. Payne. 1926—162.
Trained Electrical Men—Mechanically—By W. S. Hall. 1925—VI.
Training for Combustion Work—Employees—By W. P. E. Ainsworth. 1928-29—484.
Training for Electrical Employees—Educational—By B. A. Cornwell. 1919—378.
Transformers—Care and Operation of Power—By J. G. Corrin. 1922—23.
Transformer Construction for Steel Mills—Power—By G. A. Waters. 1914—391.
Transformers for Steel Mill Service—By E. Friedlaender. 1911—46.
Transient Phenomena on the Design and Selection of Alternating Current Equipment—Effect of—By E. G. Merrick. 1928-29—263.
Transmission and Distribution of Power in Industrial Plants—By D. M. Petty. 1920—309.
Transmission Hardware and Insulation Troubles—By A. N. Cartwright. 1928-29—299.
Transmission, Illumination, Cranes Control, Prime Movers and Motors—Report of Standardization Committee for 1918—495.
Transmission in Industrial Plants—Power—By K. M. Raynor. 1922—1.
Transmission in a Steel Plant—Underground—By F. D. Egan. 1914—295.
Transmission Line Insulation and Overhead Ground Wires—By W. E. Lewis. 1928-29—301.
Transmission Lines—Steel Conductors for—By H. B. Dwight. 1916—205.
Transmission—Power—By H. B. Vincent. 1919—135.
Transmission—Report of the Standardization Sub-Committee on—By A. R. Leavitt, Chairman. 1922—665.
Transmission—Silent Chain Power—By F. L. Morse. 1914—465.
Transmission System—Short Circuit Study Applied to a Steel Plant Power—By R. M. Hussey. 1929-30—31.
Transmission—Underground—By A. L. Freret. 1920—327.
Transportation—Electric—By F. O. Schnure. 1923—335.
Transportation—Yard Switching and Mill—By W. B. Potter and G. H. Shapter. 1926—144.
Transverse Control for Protection Against Wind and Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore Bridge—By P. R. Canney. 1923—421.
Travel Limit Devices—Crane Hoist—By W. Greenwood. 1924—701.
Travel Limits on Overhead Cranes—Hoist—By Walter Greenwood. 1929-30—359.
Traveling Crane—Electric Overhead—Questionnaire and Answers, A. I. & S. E. E., Special Committee. 1929-30—331.
Traveling Crane Specifications—A. I. & S. E. E. Electric Overhead. 1929-30—520.
Traveling Crane—10-Ton Overhead—By Cleveland Crane & Engineering Co. 1927—483.
Traveling Cranes—A. I. & S. E. E. Recommendations Covering Rules for the Safe Operation of Electric Overhead. 1926—89.
Traveling Cranes—Bridge Motors for Overhead—By R. H. McClain. 1918—347.

Traveling Cranes, Heavy Duty Steel Mill Service—General Specifications for Electric Overhead—By the Crane Standardization Committee of 1921, F. W. Cramer, Chairman. 1921—403.
Traveling Cranes—Safe Operation of Electric Overhead—By Membership. 1926—56.
Treating and Its Value to the Steel Engineer—Steel—By R. F. Crump. 1925—298.
Treating—Electric Salt Bath Furnaces for Heat—By A. E. Bellis. 1929-30—311.
Treating Furnace Applications—Electric Heat—By E. A. Hurme. 1925—229.
Treating Furnace Operating Data—Electric Heat—By R. W. Heller. 1927—136.
Treating Furnaces—Electric Annealing and Heat—By G. P. Mills. 1921—1..
Treatment and Forging of Steel—The Electric Furnace for Annealing—By Wirt S. Scott. 1918—193.
Treatment—Electric Heat—By C. A. Winder. 1919—507.
Treatment—The Tangible Advantages of Electric Heat—By Wirt S. Scott. 1929-30—289.
Trend of Boiler Development—The—By J. B. Crane. 1922—557.
Trend of Power Development—Modern—By Charles P. Steinmetz. 1922—357.
Trend of Recent Boiler Installations in Steel Works—By W. B. Skinkle. 1927—1.
Trends in Stoker Design—Modern—By Otto De Lorenzi. 1929-30—61.
Trip of Carnegie Steel Company's McDonald Mills—Inspection. 1918—219.
Trolley Control for Ore Bridges—Direct Current Hoist and —By N. L. Mortenson. 1924—879.
Trophy Award for 1927—Jones and Laughlin Safety. 1928-29—51.
Troubles from the Operating Man's Standpoint—Boiler—By C. J. Smith. 1923—343.
Troubles—Transmission Hardware and Insulation—By A. N. Cartwright. 1928-29—299.
Truck and Tractor Equipment is Effecting Savings in the Iron and Steel Industry—How Electric Industrial—By H. J. Payne. 1926—162.
Trucks for Cranes—Spring End—By John Minty. 1929-30—59.
Tube Boilers—Bent Tube vs. Straight—By W. N. Flanagan. 1922—321.
Tube Rolling Mill Drives. 1929-30—221.
Tube vs. Straight Tube Boilers—Bent—By W. N. Flanagan. 1922—321.
Tubular Poles for Line Construction—By W. T. Snyder. 1912—322.
Turbine Development—Steam—By E. Pragst. 1927—39.
Turbine Equipment, Etc.—Improving Non-Condensing Power Plant by Use of Direct Current Mixed Pressure—By R. F. Patterson. 1915—153.
Turbine Generating Units—Direct Current—By H. A. Rapelye. 1913—51.
Turbine with Special Reference to the Use of the Steam Regenerator—The Mixed Pressure Steam—By E. D. Dickinson. 1912—43.
Turbine Operation—Steam—By L. W. Heller. 1922—723.
Turbines in Iron and Steel Plants—Steam—By R. C. Muir. 1910—56.
Turbines in Steel Plants—Low Pressure—By R. C. Muir. 1909—Paper 9.
Turbines—Mixed Flow—By M. I. Nusim. 1916—601.
Turbines—Steam—By Howell Von Blarcom. 1907—Paper 15.
Turbo-Generators—By Richard H. Rice. 1917—479.
Twentieth Annual Convention—Our—By R. S. Shoemaker. 1925—VI.
Twenty-Five Cycles in Steel Mills—Sixty Cycles vs.—By J. E. Fries. 1918—543.
Twenty-Sixth Annual Convention and Iron and Steel Exposition—By F. W. Cramer. 1929-30—403.
Two High Reversing Blooming Mill—Manipulators for—By C. J. Klein. 1926—274.
Two Speed Mill Controller—Full Reverse A.C.—By E. G. Peterson. 1926—308.
Types of Direct Current Machines—The Advantages of Modern—By David Hall. 1916—83.
Types of Steel Mill Cranes—Some Modern—By W. D. Keller. 1927—245.

U

Unaflow Engine—The—By W. Trinks. 1916—139.
Underground Cables—By C. R. Sturdevant. 1912—307.
Underground Cables and Accessories—By J. C. Bowman. 1914—317.
Underground Cables—Heating of—By A. L. Freret. 1919—209.
Underground Cables—Practical Installations of—By P. H. Torchio. 1923—269.
Underground Distribution Systems—By G. J. Newton. 1916—171.
Underground System of Distribution—By W. D. Legon. 1912—297.
Underground Transmission—By A. L. Freret. 1920—327.
Underground Transmission in a Steel Plant—By F. D. Egan. 1914—295.
United States and Canada—Main Roll Drives in the. 1929-30—198.
United States—Statistical Data of Electrical Application in the Iron and Steel Industry in the—By R. Tschentscher. 1914—83.
Units—Direct Current Turbine Generating—By H. A. Rapelye. 1913—51.
Universities Create a Safety Engineering Course—Should Colleges and—By J. A. Voss. 1929-30—446.
University—Electrical Engineering at Lehigh—By J. W. Barker. 1929-30—391.
Unloaders and Ore Bridges—Controllers for Ore—By N. L. Mortenson. 1923—1.
Unloaders, Blast Furnaces and Skip Hoists—Ore—By D. W. Blakeslee. 1926—317.
Unsafe Practices in Foundries—The Correction of—By Nelson H. Kyser. 1928-29—409.
Upkeep of Direct Current Motors—Costs vs.—By A. M. MacCutcheon. 1916—371.
Use in Iron and Steel Plants—Fuel Gases and Their—By H. S. Watts. 1922—97.
Use of Carbon Brushes—Manufacture, Selection and—By E. H. Martindale. 1917—399.
Use of Carbon Tetrachloride Fuses—Outdoor Substation Practice and—By Alfred Alsaker. 1919—55.
Use of Central Station Power Service in Steel Mills—The—By Jos. McKinley. 1916—505.
Use of Central Station Power—The Electrification of Steel Mills and the—By Brent Wiley and Wilfred Sykes. 1915—177.
Use of Direct Current Mixed Pressure Turbine Equipment, Etc.—Improving Non-Condensing Power Plant by—By R. F. Patterson. 1915—153.
Use of Direct Current Motors for Main Roll Drive—Improved Rolling Mill Practice Obtained by the—By G. E. Stoltz. 1922—849.
Use of Electric Power in the Steel Industry—Factors Relating to the Economical Generation and—By Brent Wiley. 1917—311.
Use of Fuel in the Steel Plant—Economical—By H. C. Seibert. 1923—661.
Use of Lifting Magnets—Design and—By B. E. Fernow, Jr. 1913—101.
Use of Mixed Gas (Blast Furnace and Coke Oven Gas) on Open Hearth Furnaces at Wisconsin Steel Works—By G. E. Rose and F. M. Washburn. 1929-30—574.
Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses—The Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the —By W. H. Himes and R. V. Baud. 1928-29—673.
Use of Motion Pictures to Illustrate the Generation of Involute Gearing and the Use of Motion Pictures and Polarized Light as a Method of Studying Gear Stresses —By W. H. Himes and R. V. Baud. 1928-29—673.
Use of Preheated Air for Combustion Purposes—Extending the Heat Cycle in Boiler Rooms by the—By J. G. Worker. 1925—274.
Use of the Steam Regenerator—The Mixed Pressure Steam Turbine with Special Reference to the—By E. D. Dickinson. 1912—43.
Use of Waste Gases in Iron and Steel Plants—The Efficient Burning of Fuel and the—By W. W. Pettibone. 1922—49.
Use on Roll and Pinion Necks—A. I. & S. E. E. Questionnaire; Anti-Friction Bearings for. 1928-29—80.
Uses and Construction—Electrical Safety Circuits—Their—By W. M. Runyon. 1927—248.
Uses of Electricity in the Development and Manufacture of Tool Steel—By O. K. Parmiter. 1929-30—293.

Using Waste Heat—The Generation of Electric Power—By F. O. Schnure. 1925—296.
User's Standpoint—The Public Service Corporation from the Larger—By S. S. Wales. 1927—490.
Utilities—The Steel Industry and the Electric—By F. D. Mahoney and Merril Skinner. 1924—651.
Utility of Refractories—By American Refractories Institute. 1927—130.
Utilization Committee of A. I. & S. E. E.—Report of Gas—By W. N. Flanagan. 1928-29—693.
Utilization for Steam Generation—Waste Heat—By G. R. McDermott. 1921—357.
Utilization of Blast Furnace Gas—Certain Principles in the Extended—By Owen R. Rice. 1928-29—568.
Utilization of Fuel in Great Britain—By T. A. Peebles. 1928-29—587.
Utilization Practiced in Europe—Fuel—By M. J. Conway. 1928-29—590.
Utilization—Steam Generation and—By L. C. Edgar. 1928-29—697.
Utilizing Electrification in the Steel Industry—Some Methods of Best—By G. E. Stoltz. 1928-29—651.

V

Value in 1927—Iron Ore Industry Records Decrease in Output and—1928-29—49.
Value of By-Product Gas to Industry—By H. Dobrin. 1922—79.
Value of Efficient Service Departments to the General Manager—By C .S. Proudfoot. 1928-29—601.
Value of Fuels in Steel Mills—Comparative—By H. V. Flagg. 1929-30—367.
Value of Luminosity in Gas—By A. G. Witting. 1928-29—694.
Value of Records to an Operating Engineer—By Ray S. Huey. 1916—343.
Value of Safety Work—The Economic—By L. H. Burnett. 1928-29—134.
Value to the Steel Engineer—Steel Treating and Its—By R. F. Crump. 1925—298.
Valves—Latest Practice in Hydraulic—By David Brownlee. 1927—413.
Vapor Quartz Lamp—The Mercury—By W. A. D. Evans. 1913—145.
Variable Speed Drives for Main Rolls of Steel Mills—By K. A. Pauly. 1913—267.
Voltage in the Steel Industry—Survey of Lighting and—By S. G. Hibben. 1928-29—732.
Voltage Regulation—A Synchronous Condenser Installation for Power Factor Correction and—By W. O. Oschmann. 1914—109.
Voltage Rules—High—Central Alloy Steel Corporation—By J. D. Donovan. 1929-30—125.

W

Walls—Insulation of Hot Surfaces and Furnace—By L. B. McMillan. 1925—158.
Ward-Leonard Control as Applied to Blast Furnace Skip Hoists—By E. Anderson. 1928-29—477.
Waste Gases—Foreign Practice and Some Examples of the Tendency Toward Conservation of Low Grade and—By J. C. Hayes. 1928-29—695.
Waste Gases in Iron and Steel Plants—The Efficient Burning of Fuel and the Use of—By W. W. Pettibone. 1922—49.
Waste Heat and Coal—Steel Plant Power Generation from—By B. H. Greene. 1920—21.
Waste Heat Boilers—Factors Which Influence the Choice of—By J. B. Crane. 1928-29—343.
Waste Heat Boilers to Open Hearth Furnaces—Application of—By Thomas R. Tate. 1920—641.
Waste Heat—The Generation of Electric Power Using—By F. O. Schnure. 1925—296.
Waste Heat Utilization for Steam Generation—By G. R McDermott. 1921—357.
Water Conditioning—Some Results of Boiler—By R. E Hall. 1928-29—681.
Water Conditioning—The Prevention of Scale Formation by Boiler—By R. E. Hall, Carl Fischer and G. W. Smith 1924—353.
Watthour and Ampere-Hour Meters and Their Applications in Steel Mills—By R. C. Lanphier. 1914—419.
Wear in Auxiliary Steel Mill Drives—Influence of Gear Ratio on Speed of Operation, Motor Heating and Contactor—By J. E. Fries. 1919—671.
Welded Steel Buildings—Detailing of—By E. C. Brown. 1928-29—504.
Welded Structural Steel Buildings—Arc—By C. G. Watson. 1927—53.
Welder—Alternating Current Arc—By R. M. Rush. 1919—623.
Welding and the New Market for Rolling Mill Shapes—Arc—By J. F. Lincoln. 1928-29—81.
Welding Apparatus—Some Practical and Theoretical Considerations in the Design of Electrical Arc—By Robert E. Kinkead. 1919—614.
Welding—Applying the Principles of Steel Mill Practice to Arc—By J. B. Austin. 1929-30—499.
Welding—Arc—By Grover Hughes. 1928-29—467.
Welding—Arc—By J. F. Lincoln. 1912—133.
Welding Arc—Cutting Steel Mill Maintenance Costs with the—By A. M. Candy. 1925—8.
Welding—Atomic Hydrogen Arc—By J. D. Wright. 1928-29—47.
Welding Committee—Report of Electric—By S. S. Wales. 1928-29—690.
Welding—Direct Current Metal Arc—By F. T. Llewellyn. 1928-29—411.
Welding—Electric Arc—By H. L. Unland. 1918—239.
Welding—Electric Arc Cutting and—By C. J. Holslag. 1919—618.
Welding Equipment for Steel Mills and Foundries—Arc—By H. L. Unland. 1919—606.
Welding in the Steel Industry—Electric Arc—By W. L. Warner. 1925—1.
Welding in the Iron and Steel Industry—Present Status of—Arc—By Membership. 1919—603.
Welding in the Steel Plant—Organizing—By Walter Petry. 1925—21.
Welding is Selling Steel—Arc—By John Lincoln. 1928-29—280.
Welding Machines—Electric—By Frank Warren. 1912—140.
Welding—Modern Structural Industry Demands a Knowledge of—Arc—By C. J. Holslag. 1928-29—35.
Welding of Heavy Materials—Electric—By J. F. Lincoln. 1929-30—296.
Welding—Some Recent Developments in Arc—By K. L. Hansen. 1929-30—283.
Welding—Some Recent Investigations in Arc—By O. H. Eschholz. 1917—697.
Welding Steel Buildings by Electricity—Specifications for—By Frank P. McKibben. 1929-30—86.
Welding—Steel Plant Maintenance by Autogenous—By Walter Petry. 1921—679.
Welding—Structural Steel—By Frank P. McKibben. 1929-30—321.
Welding Systems—Arc—By A. M. Bennett. 1919—610.
Welding—The Plastic Arc System of—By Alexander Churchward. 1919—603.
Welding—The Present Status of Electric Arc—By A. M. Candy. 1919—627.
Welding—Thermit—By H. D. Kelly. 1925—5.
Westinghouse Electric & Mfg. Co.—A. I. & S. E. E. Inspection Trip. 1928-29—72.
What Price Certitude—By D. M. Petty. 1927—138.
What the Plant Surgeon Can Do for Safety—The Placement of Men or—By A. W. Colcord. 1928-29—438.
Wheel Mills. 1929-30—228.
Wheeling Steel Corp.—Additions to Rolling Mills at Steubenville Plant of the—By M. J. Conway. 1926—114.
Wheels and Crane Runways—Crane Track—By R. J. Harry. 1929-30—324.
Wheels—Crane Track—By E. S. Sawtelle. 1929-30—364.
Wheels—Crane Track—By W. T. Snyder. 1911—72.
Wind and Skewage Hazards of the Skew Type Direct Current Bridges—A System of Coal and Ore Bridge Transverse Control for Protection Against—By P. R. Canney. 1923—421.
Winding of Electric Machines—By H. C. Specht. 1912—269.
Windings—Direct Current Armature Windings for Multi-Polar Generators and Motors—Frog Leg—By W. H. Powell and G. M. Albrecht. 1925—198.
Windings for Multi-Polar Generators and Motors—Frog Leg Windings—Direct Current Armature—By W. H. Powell and G. M. Albrecht. 1925—198.
Wire Diagram—Electric Crane—By G. W. Richardson. 1923—36.
Wire Mills. 1929-30—228.
Wire Rope and Its Relation to Steel Making—By James F. Howe. 1915—113.

Wire Rope Problems—A Discussion of Present Day—By J. F. Howe. 1925—168.
Wires—Transmission Line Insulation and Overhead Ground —By W. W. Lewis. 1928-29—301.
Wisconsin Steel Co.—40" Reversing Blooming Mill—By F. A. Wiley. 1928-29—58.
Wisconsin Steel Works—The Use of Mixed Gas (Blast Furnace and Coke Oven Gas)—on Open Hearth Furnaces at—By G. E. Rose and F. M. Washburn. 1929-30 —574.
Without an Accident—One Hundred Days—By R. F. Gale. 1928-29—597.
Work—Comments on the Safety Committee—By the Safety Committee, W. Greenwood, Chairman. 1921—597.
Work—Employees Training for Combustion—By W. P. E. Ainsworth. 1928-29—484.
Work in the Iron and Steel Industry—Apprenticeship and Educational—By A. W. Soderberg. 1915—371.
Work of an Electrical Engineering Division—Systematizing the—By P. T. Vanderwaart. 1923—553.
Work—The Economic Value of Safety—By L. H. Burnett. 1928-29—134.
Work—The Relation of Physical Examination to Electrical —By S. C. Coey. 1915—319.
Working on Electrical Equipment—Safety Rules for Government of Employees—By Safety Committee, A. I. & S. E. E., Walter Greenwood, Chairman. 1919—315.
Works—Design of Structures for Steel—By Charles A. Randorf. 1916—427.
Works Illumination—Discussion of Paper on Steel—By B. R. Shover. 1911—198.
Works Illumination—Iron and Steel—By C. J. Mundo. 1911—165.
Works—The Regulating Storage Battery as Applied to Steel—By F. H. Woodhull. 1911—130.
Works—The Slagging Producer in Steel—By K. Huessner. 1924—669.
Works—Trend of Recent Boiler Installations in Steel—By W. B. Skinkle. 1927—1.
Worm Gearing for Electric Cranes—By G. W. Richardson. 1925—87.
Worm Gears in Steel Plants—Application of High Duty—By A. L. Henthorn. 1926—75.
Wound Motors vs. Adjustable Speed Direct Current Motors—Alternating Current Phase—By D. M. Petty. 1916 —719.

Y

Yard—Some Considerations in the Electrification of the Steel Plant Railroad—By R. B. Gerhardt. 1922—461.
Yard Switching and Mill Transportation—By W. B. Potter and G. H. Shapter. 1926—144.
Years Operation of Power Plant at Betty Furnace, Central Alloy Steel Corp.—By J. D. Donovan. 1927—500.
Youngstown Sheet & Tube Company—Electrical Installations, Brier Hill Sheet Mill—By E. F. Rhodes. 1925—84.
Youngstown Sheet & Tube Company—Heating Furnaces, Brier Hill Sheet Mill—By Strickland Kneass, Jr. 1925 —85.
Youngstown Sheet & Tube Company—Mechanical Installations, Brier Hill Sheet Mill—By E. L. McElhinney. 1925—82.

ADDENDA

The following list of Authors and Subjects is Compiled from the August 1930 to December 1931 (Inclusive) Issues of the Iron and Steel Engineer.

LIST OF AUTHORS

A

Abbiss, R. D., and D. C. West, Conversion and Distribution of General Purpose Direct Current Power in Large Industrial Plants. March, 1931—108.
Acker, A. J., L. W. White, R. J. Wadd and G. W. Baumgarten, The Theory and Practice in Connection With the Application of Brakes to Crane Motors. February, 1931—78.
Anderson, E., Series Lighting in the Steel Plant. August, 1931—350.
Anderson, H. J., Dempler, George P., Reswick, M., Helmes, M. J., McDaniels, R. C., Hodson, W. D., and A. J. Jennings, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.
Arganbright, A. N., Welding. August, 1931—360.

B

Batesole, D. E., The Lubrication of Ball and Roller Bearings in the Steel Mill. January, 1931—8.
Baumgarten, G. W., A. J. Acker, L. W. White and R. J. Wadd, The Theory and Practice in Connection With the Application of Brakes to Crane Motors. February, 1931—78.
Bayle, R. M., Recent Trends in Individual Alternating Current Roll Table Drives. March, 1931—96. Brake Applications in the Steel Industry. February, 1931—68.
Berquist, A. V., Good Housekeeping. December, 1931—509.
Bohn, D. I., and H. W. Pabst, Conductors of Heavy Alternating Currents. June, 1931—253.
Booth, J. J., Report on Questionnaire Covering Organization Maintenance and Operation of an Electrical Department in a Modern Steel Plant. August, 1930—405.
Bordeau, S. P., and W. H. Feldmann, The Hibbard Control System and Its Application to Synchronous Motors in Steel Mills. December, 1931—483.
Bradley, M. J., and J. W. Kinnear, Jr., The Automatic Reversing of Open Hearth Furnaces by the Temperature Difference Method. October, 1930—481.
Brown, J. L., Flexibility of Design in the Application of Ball and Roller Bearings to General Purpose Motors. August, 1930—416. Lubrication of Electrical Apparatus in Steel Mills. June, 1931—266.
Buchan, C. E., Synchronous Motor Driving Hammer Mill at Central Alloy Steel Company, Improves Power Factor. September, 1930—469.
Buhlmann, Frank H., Measuring of Roll Pressures. November, 1930—532.
Burr, W. H., Drying Out Electrical Equipment. August, 1930—420. Electrical Developments Committe Report, 1930-31. June, 1931—233. Air Conditioning and Ventilation. August, 1931—349.

C

Candee, A. H., Locomotives with Internal Combustion Engines for Steel Mill Transportation. September, 1930 —461.
Clark, P. C., Cleveland Welcomes the A. I. & S. E. E. June, 1931—XV.
Clauss, J. A., Description of Equipment Installed at Great Lakes Steel Corporation. December, 1930—570. Steel in Detroit. January, 1931—31. Fuel Oil System, Great Lakes Steel Corporation, Ecorse, Mich. February, 1931 —49.
Collens, C. L., Mutual Helpfulness. June, 1931—XII.
Conlee, George D., Combustion Control. September, 1931 —389.
Conway, M. J., Reaction and Temperature. August, 1930— 425. Open Hearth Combustion Control. January, 1931 —29. Open Hearth Furnace Control. June, 1931—289.
Crawford, H. V., The Constant Air-Weight Method of Cupola Blowing. December, 1930—559.

D

Dean, D. W., Electrical Auxiliaries in Steel Mills. May, 1931—199.

Dempler, George P., Reswick, M., Helmes, M. J., McDaniel, R. C., Hodson, W. D., Jennings, A. J., and H. J. Anderson, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.
Dickey, P. S., Combustion Control for Open Hearth Furnace. September, 1931—383.
Dignan, G. E., and R. L. Kirk, Interconnection Between the Duquesne Light Company and the Davidson Coke and Iron Company. March, 1931—119.
Dobrin, H., The Practical Side of Metallurgical Heat Application. June, 1931—256. The Art of Heating Marches On. January, 1931—3.
Dorcas, M. J., The Application of the Health Lamp to the Iron and Steel Industry with Relation to Health and Efficiency. December, 1931—501.
Dudley, Wray, Happy Days Will Come Again. January, 1931—1.

E

Egan, F. D., Chairman A. I. & S. E. E., Special Committee on Bearings; Preliminary Report. June, 1931—298.
Ellis, R. H., Group vs. Individual Driven Rolling Mill Stands. August, 1930—429.
Ess, T. J., Determinations of Time Required for the Heating of Steel. July, 1931—317. Graphical Carbon Balance of the Blast Furnace. April, 1931—173.

F

Farrington, James, and H. A. Winne, Electrical Equipment of the Slabbing and Strip Mills at the Wheeling Steel Corporation's Steubenville Plant. July, 1931—324.
Feldmann, W. H., and S. P. Bordeau, The Hibbard Control System and Its Application to Synchronous Motors in Steel Mills. December, 1931—483.
Fishback, F. R., Are We Becoming Less Efficient? June, 1931—XVIII.
Flagg, H. V., Open Hearth Control. October, 1930—480.
Flaherty, T. J., Spoilage of Material Due to Grease Drippage from Overhead Traveling Cranes. July, 1931—321.
Florence, H. T., Why Arc Welded Cranes? August, 1930—421.
Fox, Gordon, A Comparison of Alternating Current and Direct Current Motors for Auxiliary Drives. October, 1930—505.

G

Gale, R. F., Economical Control of Purchased Electrical Power in the Industrial Plant. November, 1930—536.
Glauch, E. S., Lubricants and Bearing Test Machine. March, 1931—129. Rolling Mill Lubrication; Effect of Various Lubricants on Power Consumption. May, 1931—215. The Testing of Lubricants. December, 1931—504.
Gray, Frank L., Testing of Lubricants. June, 1931—251.
Greenberg, M., Discussion of Open Hearth Furnace Control. October. 1930—487.
Greensward, J. D., Selection of Oil Circuit Breakers. April, 1931—155.

H

Hall, J. H., Magnetically Operated Brakes. February, 1931—73.
Hall, W. S., The Successful Installation. June, 1931—X.
Hamilton, C. P., Electrical Equipment to Operate the Blast Furnace Skip Hoist. March, 1931—139.
Harrell, F. E., Roll Table Drives. March, 1931—97.
Harwood, P. B., Developments in the Application of Control Apparatus to the Iron and Steel Industry During the Year 1930. January, 1931—13.
Helmes, M. J., McDaniel, R. C., Hodson, W. D., Jennings, A. J., Anderson, H. J., Dempler, G. P., and M. Reswick, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.
Hodgson, H. E., Life of Brake Linings and Wheels. February, 1931—69.
Hodson, W. D., Jennings, A. J., Anderson, H. J., Dempler, George P., Helmes, M. J., Reswick, M., and R. C. McDaniel, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.
Hoefle, A., and W. T. Woodmancy, Absorption of By-Product Power. March, 1931—116.
Holveck, J. E., Spraying System for Descaling Hot Steel. August, 1931—362.
Hook, I. T., Copper Alloy Welding Rods. July, 1931—337.
Hughes, Grover A., and R. C. McBride, Research Covering Alternating Current Arc Welding. June, 1931—241.
Hughes, I. Lamont, Safety in Industry. December, 1931—566.

J

Jennings, A. J., Anderson, H. J., Reswick, M., Dempler, George P., Helmes, M. J., McDaniels, R. C., and W. D. Hodson, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.
Jennings, C. H., Dynamic Properties of Arc Welded Joints. December, 1931—498.
Jessop, F. W., Did We Lose in 1930. June, 1931—XVII.
Jones, B. M., Discussion on Oil Circuit Breaker Applications in Iron and Steel Plants. April, 1931—158.

K

Keene, B. F., Electrically Operated Equipment for Automatic Combustion Control for Open Hearth Furnaces. September, 1931—393.
Kenyon, A. F., 1930 Electrical Developments. January, 1931—27.
Kieft, E., Plastic and Elastic Deformation. February, 1931—54.
King, Clarence D., The Metallic Charge in Basic Open Hearth Operation—Some Factors Affecting Operating Economies. December, 1931—493.
Kinnear, J. W., Jr., and M. J. Bradley, The Automatic Reversing of Open Hearth Furnaces by the Temperature Difference Method. October, 1930—481.
Kirk, R. L., and G. E. Dignan, Interconnection Between the Duquesne Light Company and the Davidson Coke and Iron Company. March, 1931—119.

L

Lintern, William, A Manufacturer's Opinion of the Value of Engineering Societies, Their Periodicals and Expositions. June, 1931—XV.

Mc

McBride, R. C., and Grover A. Hughes, Research Covering Alternating Current Arc Welding. June, 1931—241.
McCaffery, Richard S., The Bessemer Process and Its Product (Excerpt). November, 1931—467.
McDaniel, R. C., Hodson, W. D., Jennings, A. J., Anderson, H. J., Reswick, M., Dempler, G. P., and M. J. Helmes, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.
McElhinney, J. H., Developments in Products at Lukens Steel Company. January, 1931—6.
McKnight, Charles, The Electric Furnace as a Metallurgical Tool in the Steel Industry. May, 1931—224.

M

Mohler, F. H., Motor and Control Equipment for Cold Strip Mill Drives. June, 1931—272.
Murray, J. S., Electricity and Industrial Safety Problems. September, 1930—111. Follansbee, W. Va., Plant of Follansbee Brothers Company Changes from 25 Cycles to 60 Cycles. November, 1931—453.

N

Northrup, E. F., The Coreless Induction Furnace in the Steel Industry. May, 1931—210.

O

Otis, A. N., Principles and Some Practical Applications of Electric Furnaces with Atmospheric Control. August, 1931—352.

P

Pabst, H. W., and D. I. Bohn, Conductors of Heavy Alternating Currents. June, 1931—253.
Palmer, C. G., Who Will Benefit from Multi-Shift Buildings. November, 1931—478.
Pecu, C. C., Report of A. I. & S. E. E., General Lubrication Committee. June, 1931—264.
Petty, David M., Transportation Within the Steel Plant. December, 1930—573.
Pfeffer, George C., The Application of the Electric Motor to the Production of Cast Iron Pipe. December, 1930—584. The Installation, Use and Maintenance of Fire Hydrants. November, 1931—471.

R

Raube, W. C., Shunt or Series Brakes on Anti-Friction Bearing Equipped Trolleys? February, 1931—76.
Reswick, Maurice, Automatic Pressure Lubricating Systems for Roll Necks. October, 1930—503.
Reswick, M., Helmes, M. J., McDaniel, R. C., Hodson, W. D., Jennings, A. J., Anderson, H. J., and G. P. Dempler, Devices and Appliances for Steel Mill Roll Neck Lubrication. April, 1931—178.

Roberts, J. L., Steam Turbine Lubrication. August, 1931—374.
Robinson, M. R., Air Filtration as Applied to the Steel Industry. January, 1931—15.
Rose, George E., The Manufacture of Welding Wire. May, 1931—227.

S

Sanner, R. F., Cost Records. January, 1931—5.
Schnure, F. O., Prodigal Power. June, 1931—VII. Interconnections of Power Between Public Utilities and Large Industrial Users. March, 1931—106.
Shadgen, J. F., Machine Control of Combustion in Metallurgical Furnaces of the Iron and Steel Industry. October, 1930—490. Electrical versus Mechanical Devices Used in Control and Regulation Engineering. September, 1931—378.
Shallcross, W. M., Electrical versus Mechanical Devices Used in Connection with Combustion Control Apparatus. September, 1931—397.
Simkins, E. S., Some Notes on Underground Cables. January, 1931—32.
Simpson, R. W. Automatic Combustion Control for Open Hearth Furnaces. October, 1930—485. Discussion of Regulators for Open Hearth Combustion Control. September, 1931—399.
Skinkle, W. B., Discussion of Papers on Inter-Connections Between Public Utilities and Large Industrials and the Interchange of Power Between the Two Systems. May, 1931—205.
Snyder, W. B., Individual Drives for Table Rolls. March, 1931—93.
Spraragen, W., Welding and Its Possibilities. June, 1931—XIII.
Stansel, N. R., Electrical Apparatus for the Coreless Induction Furnace. November, 1930—519.
Stitt, H. E., Controlled Conditions Plant. November, 1931—474.
Stokes, H. E., and R. H. Wright, Twin Motor Drive. June, 1931—246.
Sykes, W., Utilization of Electricity—Twenty-five Years' Progress in the Steel Industry Through the Development of Rolling Mill Drives. June, 1931—XI.

T

Thompson, C. M., Molybdenum Wound Hydrogen Furnaces for Copper Brazing. September, 1930—471.

V

Van Campen, J. H., Lubrication and Its Application to Machine Tools. June, 1931—287.
Voss, J. A., Hand Labor and Trucking. December, 1931—513.

W

Wadd, R. J., Baumgarten, G. W., Acker, A. J., and L. W. White, The Theory and Practice in Connection With the Application of Brakes to Crane Motors. February, 1931—78.
Waldorf, Fred, Power Consumption Tests on the Timken Steel and Tube Company's Blooming and Bar Mills. October, 1930—442.
Walther, H. H., The Manufacture of Acid Electric Steel and Cast Iron. October, 1931—415.
West, D. C., and R. D. Abbiss, Conversion and Distribution of General Purpose Direct Current Power in Large Industrial Plants. March, 1931—108.
Winne, H. A., 1930 Developments in Electrical Equipment for Steel Mills. January, 1931—21.
Winne, H. A., and James Farrington, Electrical Equipment of the Slabbing and Strip Mills at the Wheeling Steel Corporation's Steubenville Plant. July, 1931—324.
Wohlgemuth, M. J., The Steel Plant System Analysis—The Short Circuit Study. April, 1931—153.
Wood, R. D., A Practical Sales Policy. December, 1931—508.
Woodmancy, W. T., and A. Hoefle, Absorption of By-Product Power. March, 1931—116.
Woodson, J. C., Electrically Heated Annealing Furnaces for the Steel and Other Industries. March, 1931—122.
Wright, R. H., and H. E. Stokes, Twin Motor Drive. June, 1931—246.
White, L. W., R. J. Wadd, G. W. Baumgarten and A. J. Acker, The Theory and Practice in Connection With the Application of Brakes to Crane Motors. February, 1931—78.

LIST OF SUBJECTS

A

Absorption of By-Product Power—By A. Hoefle and W. T. Woodmancy. March, 1931—116.
Acid Electric Steel and Cast Iron—The Manufacture of—By H. H. Walther. October, 1931—415.
Affecting Operating Economies—Some Factors—The Metallic Charge in Basic Open Hearth Operations—By C. D. King. December, 1931—493.
A. I. & S. E. E. and the A. I. E. E.—By the Membership of the—Industrial Power Applications—March, 1931—105.
A. I. & S. E. E.—Cleveland Welcomes the—By P. C. Clark. June, 1931—XV.
A. I. & S. E. E. Crane Specifications. November, 1930—545.
A. I. & S. E. E., Electrical Developments Committee Report—1930-31—By W. H. Burr, Ch. June, 1931—233.
A. I. & S. E. E. General Lubrication Committee—Report of—By C. C. Pecu, Ch. June, 1931—264.
A. I. & S. E. E. Special Committee on Bearings—Preliminary Report of the—By F. D. Egan, Ch. June, 1931—298.
A. I. & S. E. E. Suggestions to Electrical Manufacturers in Connection with Standardized Symbols for Control Apparatus. October, 1931—438.
A. I. E. E.—By the Membership of the A. I. & S. E. E.—Industrial Power Applications—March, 1931—105.
Air Conditioning. November, 1931—470.
Air Conditioning and Ventilation—By W. H. Burr. August, 1931—349.
Air Conditioning Equipment. November, 1931—468.
Air Filtration as Applied to the Steel Industry—By M. R. Robinson. January, 1931—15.
Air Weight Method of Cupola Blowing—The Constant—By H. V. Crawford. December, 1930—559.
Alloy Welding Rods—Copper—By I. T. Hook. July, 1931—337.
Alternating and Direct Current Motors for Auxiliary Drives—A Comparison—Of—By Gordon Fox. October, 1930—505.
Alternating Current Arc Welding—Research Covering—By G. A. Hughes and R. C. McBride. June, 1931—241.
Alternating Current Roll Table Drives—Recent Trends in Individual—By R. M. Bayle. March, 1931—96.
Alternating Currents—Conductors of Heavy—By D. I. Bohn and H. W. Pabst. June, 1931—253.
Analysis—Steel Plant System—The Short Circuit Study—By M. J. Wohlgemuth. April, 1931—153.
Annealing Furnaces for the Steel and Other Industries—Electrically Heated—By J. C. Woodson. March, 1931—122.
Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special Study Regarding Operation in the Steel Industry of—July, 1931—II.
Anti-Friction Bearing Equipped Mill Type Motors—Special Study Regarding Operation of—Questionnaire for Bearing Manufacturers. July, 1931—III.
Anti-Friction Bearing Equipped Trolleys?—Shunt or Series Brakes on—By W. C. Raube. February, 1931—76.
Apparatus—Electrical versus Mechanical Devices Used in Connection with Combustion Control—By W. M. Shallcross. September, 1931—397.
Apparatus for Cold Strip Mill Drives—Motors and Control—By F. Mohler. June, 1931—272.
Apparatus for the Coreless Induction Furnace—Electrical—By N. R. Stansel. November, 1930—519.
Apparatus—The A. I. & S. E. E. Suggestion to the Electrical Manufacturers in Connection with Standardized Symbols for Control—October, 1931—438.

Apparatus to the Iron and Steel Industry During the Year 1930—Developments in the Application of Control—By P. B. Harwood. January, 1931—13.
Apparatus Used in Steel Mills—Lubrication of Electrical—By J. L. Brown. June, 1931—266.
Appliances for Steel Mill Roll Neck Lubrication—Devices and—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.
Application of Brakes to Crane Motors—The Theory and Practice in Connection with the—By A. J. Acker, R. J. Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.
Application of Ball and Roller Bearings to General Purpose Motors—Flexibility of Design in the—By J. L. Brown. August, 1930—416.
Application of Control Apparatus in the Iron and Steel Industry During the Year, 1930—Developments in the—By P. B. Harwood. January, 1931—13.
Application of the Electric Motor to the Production of Cast Iron Pipe—The—By George C. Pfeffer. December, 1930—589.
Application of the Health Lamp to the Iron and Steel Industry with Relation to Health and Efficiency—The—By M. J. Dorcas. December, 1931—501.
Application—The Practical Side of Metallurgical Heat—By H. Dobrin. June, 1931—256.
Application to Machine Tools—Lubrication and Its—By J. H. Van Campen. June, 1931—287.
Application to Synchronous Motors in the Steel Mills—The Hibbard Control System and Its—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
Applications in Iron and Steel Plants—Discussion Oil Circuit Breaker—By B. M. Jones. April, 1931—158.
Applications—Industrial Power—By the Membership of the A. I. & S. E. E. and the A. I. E. E. March, 1931—105.
Applications in the Steel Industry—Brake—By R. M. Bayle. February, 1931—68.
Applications of Electric Furnaces with Atmospheric Control—Principles and Some Practical—By A. N. Otis. August, 1931—352.
Applied to the Steel Industry—Air Filtration as—By M. R. Robinson. January, 1931—15.
Arc Weld Cranes—Why—By H. T. Florence. August, 1930—421.
Arc Welded Joints—Dynamic Properties of—By C. H. Jennings. December, 1931—498.
Arc Welding. November, 1931—470.
Arc Welding—Research Covering Alternating Current—By G. A. Hughes and R. C. McBride. June, 1931—241.
Are We Becoming Less Efficient?—By F. R. Fishback. June, 1931—XVIII.
Art of Heating Marches On—The—By H. Dobrin. January, 1931—3.
Atmospheric Control—Principles and Some Practical Applications of Electric Furnaces with—By A. N. Otis. August, 1931—352.
Automatic Combustion Control for Open Hearth Furnaces—By R. W. Simpson. October, 1930—485.
Automatic Combustion Control for Open Hearth Furnaces—Electrically Operated Equipment for—By B. F. Keene. September, 1931—393.
Automatic Pressure Lubricating Systems for Roll Necks—By Maurice Reswick. October, 1930—503.
Automatic Reversing of Open Hearth Furnaces by the Temperature Difference Method—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.
Auxiliaries in Steel Mills—Electrical—By D. W. Dean. May, 1931—199.
Auxiliary Drives—A Comparison of Alternating and Direct Current Motors for—By Gordon Fox. October, 1930—505.

B

Balance of the Blast Furnace—Graphical Carbon—By T. J. Ess. April, 1931—173.
Ball and Roller Bearings in the Steel Mill—The Lubrication of—By D. E. Batesole. January, 1931—8.
Ball and Roller Bearings to General Purpose Motors—Flexibility of Design in the Application of—By J. L. Brown. August, 1930—416.
Bar Mills—Power Consumption Tests on the Timken Steel and Tube Company's Blooming and—By Fred Waldorf. September, 1930—442.
Basic Open Hearth Operations—The Metallic Charge in—Some Factors Affecting Operating Economies—By C. D. King. December, 1931—493.
Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special Study Regarding Operation in the Steel Industry of Anti-Friction—July, 1931—II.
Bearing Equipped Mill Type Motors—Special Study Regarding Operation of Anti-Friction—Questionnaire for Bearing Manufacturers—July, 1931—III.
Bearing Equipped Trolleys—Shunt or Series Brakes on Anti-Friction—By W. C. Raube. February, 1931—76.
Bearing Manufacturers—Questionnaire for—Special Study Regarding Operation of Anti-Friction Bearing Equipped Mill Type Motors—July, 1931—III.
Bearing Test Machine—Lubricants and—By E. S. Glauch. March, 1931—129.
Bearings in the Steel Mill—The Lubrication of Ball and Roller—By D. E. Batesole. January, 1931—8.
Bearings—Preliminary Report of the A. I. & S. E. E. Special Committee on—By F. D. Egan, Ch. June, 1931—298.
Bearings to General Purpose Motors—Flexibility of Design in the Application of Ball and Roller—By J. L. Brown. August, 1930—416.
Becoming Less Efficient—Are We—By F. R. Fishback. June, 1931—XVIII.
Benefit from Multi-Shift Buildings—Who Will—By C. G. Palmer. November, 1931—478.
Bessemer Process—An Electrical Development Which is Producing Quality and Uniformity of Product in the—By R. S. McCaffrey. November, 1931—467.
Between Public Utilities and Large Industrial Users—Interconnections of Power—By F. O. Schnure. March, 1931—106.
Between Public Utility and Large Industrials and the Interchange of Power Between the Two Systems—Discussion of Papers on Inter-Connections—By W. B. Skinkle. May, 1931—205.
Between the Duquesne Light Company and the Davidson Coke and Iron Company—Interconnection—By G. E. Dignan and R. L. Kirk. March, 1931—119.
Between the Two Systems—Discussion of Papers on Inter-Connections Between Public Utilities and Large Industrials and the Interchange of Power—By W. B. Skinkle. May, 1931—205.
Blast Furnace—Graphical Carbon Balance of the—By T. J Ess. April, 1931—173.
Blast Furnace Skip Hoist—Electrical Equipment to Operate the—By C. P. Hamilton. March, 1931—139.
Blooming and Bar Mills—Power Consumption Tests on the Timken Steel and Tube Company's—By Fred Waldorf. September, 1930—442.
Blowing—The Constant Air Weight Method of Cupola—By H. V. Crawford. December, 1930—559.
Brake Applications in the Steel Industry—By R. M. Bayle. February, 1931—68.
Brake Linings and Wheels—Life of—By H. E. Hodgson. February, 1931—69.
Brakes—Magnetically Operated—By J. H. Hall. February, 1931—73.
Brakes on Anti-Friction Bearing Equipped Trolleys—Shunt or—Series—By W. C. Raube. February, 1931—76.
Brakes to Crane Motors—The Theory and Practice in Connection with the Application of—By A. J. Acker, R. J. Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.
Brazing—Molybdenum Wound Hydrogen Furnaces for Copper—By C. M. Thompson. September, 1930—471.
Breaker Applications in Iron and Steel Plants—Discussion—Oil-Circuit—By B. M. Jones. April, 1931—158.
Breakers—The Selection of Oil-Circuit—By J. D. Greensward. April, 1931—155.
Buildings—Who Will Benefit from Multi-Shift—By C. G Palmer. November, 1931—478.
By-Product Power—Absorption of—By A. Hoefle and W. T. Woodmancy. March, 1931—116.

C

Cables—Some Notes on Underground—By E. S. Simkins. January, 1931—32.
Carbon Balance of the Blast Furnace—Graphical—By T. J. Ess. April, 1931—173.
Cast Iron Pipe—The Application of the Electric Motor to the Production of—By George C. Pfeffer. December, 1930—589.

Cast Iron—The Manufacture of Acid Electric Steel and—By H. H. Walther. October, 1931—415.
Central Alloy Steel Company Improves Power Factor—Synchronous Motor Driving Hammer Mill at—By C. E. Buchan. September, 1930—469.
Charge in Basic Open Hearth Operations—The Metallic—Some Factors Affecting Operating Economies—By C. D. King. December, 1931—493.
Circuit Breaker Application in Iron and Steel Plants—Discussion on—By B. M. Jones. April, 1931—158.
Circuit Breakers—Selection of—By J. D. Greensward. April, 1931—155.
Cleveland Welcomes the A. I. & S. E. E.—By P. C. Clark June, 1931—XV.
Cold Strip Mill Drives—Motor and Control Apparatus for—By F. Mohler. June, 1931—272.
Combustion Control—By George D. Conlee. September, 1931—389.
Combustion Control Apparatus—Electrical versus Mechanical Devices Used in Connection with—By W. M. Shallcross. September, 1931—397.
Combustion Control—Discussion of Regulators for Open Hearth—By R. W. Simpson. September, 1931—399.
Combustion Control for Open Hearth Furnaces—Automatic—By R. W. Simpson. October, 1930—485.
Combustion Control for Open Hearth Furnaces—Electrically Operated Equipment—for Automatic—By B. F. Keene. September, 1931—393.
Combustion Control for the Open Hearth Furnace—By P. S. Dickey. September, 1931—383.
Combustion Control—Open Hearth—By M. J. Conway. January, 1931—29.
Combustion Engineering—A Review of—January, 1931—25.
Combustion Engines for Steel Mill Transportation—Locomotives with Internal—By A. H. Candee. September, 1930—461.
Combustion in Metallurgical Furnaces in the Iron and Steel Industry—Machine Control of—By J. F. Shadgen. October, 1930—490.
Comparison of Alternating and Direct Current Motors for Auxiliary Drives—A—By Gordon Fox. October, 1930—505.
Conditioning—Air—November, 1931—470.
Conditioning and Ventilation—Air—By W. H. Burr. August, 1931—349.
Conditioning Equipment—Air—November, 1931—468.
Conditions Plant—Controlled—By H. E. Stitt. November, 1931—474.
Conductors of Heavy Alternating Currents—By D. I. Bohn and H. W. Pabst. June, 1931—253.
Connection with Combustion Control Apparatus—Electrical versus Mechanical Devices Used in—By W. M. Shallcross. September, 1931—397.
Connection with a Special Study Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in—July, 1931—II.
Connection with Lubrication Engineering Divisions Questionnaire—Tabulated Data in—October, 1931—422.
Connection with Standardized Symbols for Control Apparatus—The A. I. & S. E. E. Suggestions to the Electrical Manufacturers in—October, 1931—438.
Connection with the Application of Brakes to Crane Motors—The Theory and Practice in—By A. J. Acker, R. J. Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.
Constant Air Weight Method of Cupola Blowing—By H. V. Crawford. December, 1930—559.
Construction Program—1930—Iron and Steel Industry—January, 1931—40.
Consumption—Effect of Various Lubricants on Power—Rolling Mill Lubrication—By E. S. Glauch. May, 1931—215.
Consumption Tests on the Timken Steel and Tube Company's Blooming and Bar Mills—Power—By Fred Waldorf. September, 1930—442.
Control and Regulation Engineering—Electrical vs. Mechanical Devices Used in—By J. F. Shadgen. September, 1931—378.
Control Apparatus—Electrical versus Mechanical Devices Used in Connection with Combustion—By W. M. Shallcross. September, 1931—397.
Control Apparatus for Cold Strip Mill Drives—Motor and—By F. Mohler. June, 1931—272.
Control Apparatus—The A. I. & S. E. E. Suggestion to the Electrical Manufacturers in Connection with Standardized Symbols for—October, 1931—438.
Control Apparatus to the Iron and Steel Industry—During the Year, 1930—Developments in the Application of—By P. B. Harwood. January, 1931—13.
Control—Combustion—By G. D. Conlee. September, 1931—389.
Control—Discussion of Open Hearth Furnace—By M. Greenberg. October, 1930—487.
Control—Discussion of Regulators for Open Hearth Combustion—By R. W. Simpson. September, 1931—399.
Control for Open Hearth Furnaces—Automatic Combustion—By R. W. Simpson. October, 1930—485.
Control for Open Hearth Furnaces—Combustion—By P. S. Dickey. September, 1931—383.
Control for Open Hearth Furnaces—Electrically Operated Equipment for Automatic Combustion—By B. F. Keene. September, 1931—393.
Control of Combustion in Metallurgical Furnaces in the Iron and Steel Industry—Machine—By J. F. Shadgen. October, 1930—490.
Control of Purchased Electrical Power in the Industrial Plant—Economical—By R. F. Gale. November, 1930—536.
Control—Open Hearth—By H. V. Flagg. October, 1930—480.
Control—Open Hearth Combustion—By M. J. Conway. January, 1931—29.
Control—Open Hearth Furnace—By M. J. Conway. June, 1931—289.
Control—Principles and Some Practical Applications of Electric Furnaces with Atmospheric—By A. N. Otis. August, 1931—352.
Control—Symposium on Open Hearth Furnace—October, 1930—479.
Control System and Its Application to Synchronous Motors in the Steel Mills—The Hibbard—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
Controlled Conditions Plant—By H. E. Stitt. November, 1931—474.
Conversion and Distribution of General Purpose D.C. Power in Large Industrial Plants—By R. D. Abbiss and D. C. West. March, 1931—108.
Copper Alloy Welding Rods—By I. T. Hook. July, 1931—337.
Copper Brazing—Molybdenum Wound Hydrogen Furnaces for—By C. M. Thompson. September, 1930—471.
Coreless Induction Furnace—Electrical Apparatus for the—By N. R. Stansel. November, 1930—519.
Coreless Induction Furnace in the Steel Industry—The—By E. F. Northrup. May, 1931—210.
Cost Records—By R. F. Sanner. January, 1931—5.
Covering Alternating Current Arc Welding—Research—By G. A. Hughes and R. C. McBride. June, 1931—241.
Covering Organization, Maintenance and Operation of an Electrical Department in a Modern Steel Mill—Report on Questionnaire—By J. J. Booth. August, 1930—405.
Crane Motors—The Theory and Practice in Connection with the Application of Brakes to—By A. J. Acker, R. J. Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.
Crane Specifications—A. I. & S. E. E.—November, 1930—545.
Crane Statistics, 1930—Electrically Operated—January, 1931—43.
Cranes—Points to be Kept in Mind When Ordering Worm Gearing for Electric Overhead Traveling—November, 1931—469.
Cranes—Spoilage of Material Due to Grease Drippage from Overhead Traveling—By T. J. Flaherty. July, 1931—321.
Cranes—Why Arc Weld—By H. T. Florence. August, 1930—421.
Cupola Blowing—The Constant Air Weight Method of—By H. V. Crawford. December, 1930—559.
Cycles—Follansbee, W. Va., Plant of the Follansbee Brothers Company Changes from Twenty-five Cycles to Sixty—By J. S. Murray. November, 1931—453.

D

Data in Connection with Lubrication Engineering Divisions Questionnaire—Tabulated—October, 1931—422.
Davidson Coke and Iron Company—Interconnection Between the Duquesne Light Company and the—By G. E. Dignan and R. L. Kirk. March, 1931—119.

Deformation—Plastic and Elastic—By E. Kieft. February, 1931—54.
Department in a Modern Steel Mill—Report on Questionnaire Covering Organization, Maintenance and Operation of an Electrical—By J. J. Booth. August, 1930—405.
Descaling Hot Steel—Spraying System for—By J. E. Holveck. August, 1931—362.
Description of Equipment Installed at Great Lakes Steel Corporation—December, 1930—570.
Design in the Application of Ball and Roller Bearings to General Purpose Motors—Flexibility of—By J. L. Brown. August, 1930—416.
Determination of Time Required for the Heating of Steel—By T. J. Ess. July, 1931—317.
Detroit—Steel in—By J. A. Clauss. January, 1931—31.
Development Committee Report—1930-31—A. I. & S. E. E. Electrical—By W. H. Burr, Ch. June, 1931—233.
Development of Rolling Mill Drives—Twenty-five Years Progress in the Steel Industry Through the—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.
Development Which is Producing Quality and Uniformity of Product in the Bessemer Process—An Electrical—By R. S. McCaffrey. November, 1931—467.
Developments in Electrical Equipment for Steel Mills—1930—By H. A. Winne. January, 1931—21.
Developments in Products at Lukens Steel Company—By J. H. McElhinney. January, 1931—6.
Developments in Sheet Mills—Recent—November, 1931—III.
Developments in the Application of Control Apparatus in the Iron and Steel Industry During the Year, 1930—By P. B. Harwood. January, 1931—13.
Developments, 1930—Electrical—By A. F. Kenyon. January, 1931—27.
Devices and Appliances for Steel Mill Roll Neck Lubrication—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.
Devices Used in Connection with Combustion Control Apparatus—Electrical versus Mechanical—By W. M. Shallcross. September, 1931—397.
Devices Used in Control and Regulation Engineering—Electrical vs. Mechanical—By J. F. Shadgen. September, 1931—378.
Did We Lose in 1930?—By F. W. Jessop. June, 1931—XVII.
Difference Method—The Automatic Reversing of Open Hearth Furnaces by the Temperature—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.
Direct Current Motors for Auxiliary Drives—A Comparison of Alternating and—By Gordon Fox. October, 1930—505.
Direct Current Power in Large Industrial Plants—The Conversion and Distribution of General Purpose—By R. D. Abbiss and D. C. West. March, 1931—108.
Drives—A Comparison of Alternating and Direct Current Motors for Auxiliary—By Gordon Fox. October, 1930—505.
Discussion—Conductors of Heavy Alternating Currents—October, 1931—447.
Discussion—Devices and Appliances for Steel Mill Roll Neck Lubrication—April, 1931—178.
Discussion—Drives for Roll Tables—By Membership. March, 1931—100.
Discussion—Electrical versus Mechanical Devices Used in Combustion Control of Open Hearth Furnaces—September, 1931—411.
Discussion—Group vs. Individual Driven Rolling Mill Stands—By Membership. August, 1930—432.
Discussion—Industrial Power Applications, Joint Meeting A. I. & S. E. E. and A. I. E. E.—August, 1931—368.
Discussion—Installation, Use and Maintenance of Fire Hydrants—November, 1931—473.
Discussion—Lubrication Papers Presented at Twenty-Seventh Annual Convention of A. I. & S. E. E.—October, 1931—429.
Discussion of Open Hearth Furnace Control—By M. Greenberg. October, 1930—487.
Discussion of Papers on Inter-Connections Between Public Utility and Large Industrials and the Interchange of Power Between the Two Systems—By W. B. Skinkle. May, 1931—205.
Discussion of Regulators for Open Hearth Combustion Control—By R. W. Simpson. September, 1931—399.
Discussion—Oil Circuit Breaker Application in Iron and Steel Plants—By B. M. Jones. April, 1931—158.
Discussion—Oil Circuit Breaker Applications in Iron and Steel Plants—By Membership. April, 1931—161.
Discussion—Open Hearth Furnace Control—October, 1930—493.
Discussion—Open Hearth Furnace Control—September, 1931—406.
Discussion—Principles and Some Practical Applications of Electric Furnaces with Atmospheric Control—By Membership. August, 1931—359.
Discussion—Recent Developments in Industrial Furnace Design—October, 1930—493.
Discussion—Research Covering Alternating Current Arc Welding—October, 1931—445.
Discussion—Should Colleges and Universities Create a Safety Course?—December, 1930—567.
Discussion—Steel Mill Lighting Problems—November, 1930—529.
Discussion—The A. I. & S. E. E. Suggestions to the Electrical Manufacturers in Connection with Standardized Symbols for Control Apparatus—October, 1931—439.
Discussion—The Application of the Electric Motor to the Production of Cast Iron Pipe—December, 1930—589.
Discussion—The Hibbard Control System and Its Application to Synchronous Motors in Steel Mills—December, 1931—491.
Discussion—The Practical Side of Metallurgical Heat Application—September, 1931—401.
Discussion—The Theory and Practice in Connection With the Application of Brakes to Motors for Cranes, Screwdowns, Mill Tables, Etc.—February, 1931—81.
Discussion—Twin Motor Drive—December, 1931—504.
Distribution of General Purpose D.C. Power in Large Industrial Plants—Conversion and—By R. D. Abbiss and D. C. West. March, 1931—108.
Drippage from Overhead Traveling Cranes—Spoilage of Material Due to Grease—By T. J. Flaherty. July, 1931 321.
Drive Statistics, 1930—Main Roll—January, 1931—34.
Drive—Twin Motor—By R. H. Wright and H. E. Stokes. June, 1931—246.
Driven Rolling Mill Stands—Group vs. Individual—By R. H. Ellis. August, 1930—425.
Drives—A Comparison of Alternating and Direct Current Motors for Auxiliary—By Gordon Fox. October, 1930—505.
Drives for Table Rolls—Individual—By W. B. Snyder. March, 1931—93.
Drives—Motor and Control Apparatus for Cold Strip Mill—By F. Mohler. June, 1931—272.
Drives—Recent Trends in Individual A.C. Roll Table—By R. M. Bayle. February, 1931—96.
Drives—Roll Table—By F. E. Harrell. March, 1931—97.
Drives—Twenty-five Years Progress in the Steel Industry Through the Development of Rolling Mill—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.
Driving Hammer—Mill at Central Alloy Steel Company Improves Power Factor—Synchronous Motor—By C. E. Buchan. September, 1930—469.
Drying Out Electrical Equipment—By W. H. Burr. August, 1930—420.
Due to Grease Drippage from Overhead Traveling Cranes—Spoilage of Material—By T. J. Flaherty. July, 1931—321.
Duquesne Light Company and the Davidson Coke and Iron Company—Interconnection Between the—By G. E. Dignan and R. L. Kirk. March, 1931—119.
During the Year, 1930—Developments in the Application of Control Apparatus to the Iron and Steel Industry—By P. B. Harwood. January, 1931—13.
Dynamic Properties of Arc Welded Joints—By C. H. Jennings. December, 1931—498.

E

Economical Control of Purchased Electrical Power in the Industrial Plant—By R. F. Gale. November, 1930—536.
Economies—Some Factors Affecting Operating—The Metallic Charge in Basic Open Hearth Operation—By C. D. King. December, 1931—493.
Effect of Various Lubricants on Power Consumption—Rolling Mill Lubrication—By E. S. Glauch. May, 1931—215.

Efficiency—The Application of the Health Lamp to the Iron and Steel Industry with Relation to Health and—By M. J. Dorcas. December, 1931—501.
Efficient—Are We Becoming Less—By F. R. Fishback. June, 1931—XVIII.
Elastic Deformation—Plastic and—By E. Kieft. February, 1931—54.
Electric Furnace as a Metallurgical Tool in the Steel Industry—The—By Charles McKnight. May, 1931—224.
Electric Furnaces with Atmospheric Control—Principles and Some Practical Applications of—By A. N. Otis. August, 1931—352.
Electric Motor to the Production of Cast Iron Pipe—The Application of the—By George C. Pfeffer. December, 1930—589.
Electric Overhead Traveling Cranes—Points to be Kept in Mind When Ordering Worm Gearing for—November, 1931—469.
Electric Steel and Cast Iron—The Manufacture of Acid—By H. H. Walther. October, 1931—415.
Electrical Apparatus for the Coreless Induction Furnace—By N. R. Stansel. November, 1930—519.
Electrical Apparatus Used in Steel Mills—Lubrication of—By J. L. Brown. June, 1931—266.
Electrical Auxiliaries in Steel Mills—By D. W. Dean. May, 1931—199.
Electrical Department in a Modern Steel Mill—Report on Questionnaire Covering Organization, Maintenance and Operation of an—By J. J. Booth. August, 1930—405.
Electrical Development Which is Producing Quality and Uniformity of Product in the Bessemer Process—By R. S. McCaffrey. November, 1931—467.
Electrical Development Committee Report—1930-31—A. I. & S. E. E.—By W. H. Burr, Ch. June, 1931—233.
Electrical Developments, 1930—By A. F. Kenyon. January, 1931—27.
Electrical Equipment—Drying Out—By W. H. Burr. August, 1930—420.
Electrical Equipment for Steel Mills—1930 Developments in—By H. A. Winne. January, 1931—21.
Electrical Equipment of the Slabbing and Hot Strip Mills at the Wheeling Steel Corporation's Steubenville Plant—By James Farrington and H. A. Winne. July, 1931—323.
Electrical Equipment to Operate the Blast Furnace Skip Hoist—By C. P. Hamilton. March, 1931—139.
Electrical Manufacturers in Connection with Standardized Symbols for Control Apparatus—The A. I. & S. E. E. Suggestions to the—October, 1931—438.
Electrical Power in the Industrial Plant—Economical Control of Purchased—By R. F. Gale. November, 1930—536.
Electrical versus Mechanical Devices Used in Connection with Combustion Control Apparatus—By W. M. Shallcross. September, 1931—397.
Electrical vs. Mechanical Devices Used in Control and Regulation Engineering—By J. F. Shadgen. September, 1931—378.
Electrically Heated Annealing Furnaces for the Steel and Other Industries—By J. C. Woodson. March, 1931—122.
Electrically Operated Crane Statistics, 1930—January, 1931—43.
Electrically Operated Equipment for Automatic Combustion Control for Open Hearth Furnaces—By B. F. Keene. September, 1931—393.
Electricity and Industrial Safety Problems—By J. S. Murray. September, 1930—III.
Electricity—Utilization of—Twenty-five Years Progress in the Steel Industry Through the Development of Rolling Mill Drives—By Wilfred Sykes. June, 1931—XI.
Elements of Lubrication Practice—December, 1930—582.
Engineering—Electrical vs. Mechanical Devices Used in Control and Regulation—By J. F. Shadgen. September, 1931—378.
Engineering—A Review of Combustion—January, 1931—25.
Engineering Societies, Their Periodicals and Expositions—A Manufacturers Opinion of the Value of—By William Lintern. June, 1931—XV.
Engines for Steel Mill Transportation—Locomotives with Internal Combustion—By A. H. Candee. September, 1930—461.
Equipment—Air Conditioning—November, 1931—468.
Equipment—Drying Out Electrical—By W. H. Burr. August, 1930—420.
Equipment for Automatic Combustion Control for Open Hearth Furnaces—Electrically Operated—By B. F. Keene. September, 1931—393.
Equipment for Steel Mills—1930 Developments in Electrical—By H. A. Winne. January, 1931—21.
Equipment Installed at Great Lakes Steel Corporation—Description of—December, 1930—570.
Equipment of the Slabbing and Hot Strip Mill at the Wheeling Steel Corporation's Steubenville Plant—Electrical—By James Farrington and H. A. Winne. July, 1931—323.
Equipment to Operate the Blast Furnace Skip Hoist—Electrical—By C. P. Hamilton. March, 1931—139.
Equipped Mill Type Motors—Questionnaire in Connection with a Special Study Regarding Operation in the Steel Industry of Anti-Friction Bearing—July, 1931—II.
Equipped Mill Type Motors—Special Study Regarding Operation of Anti-Friction Bearing—Questionnaire for Bearing Manufacturers—July, 1931—III.
Equipped Trolleys-Shunt or Series Brakes on Anti-Friction Bearing—By W. C. Raube. February, 1931—76.
Erected in Schenectady—Largest Mercury Vapor Turbine will be—February, 1931—87.
Everybody's Problem—Lubrication. August, 1930—111.
Expositions—A Manufacturers Opinion of the Value of Engineering Societies. Their Periodicals and Expositions—By William Lintern. June, 1931—XV.

F

Factors Affecting Operating Economies—Some—The Metallic Charge in Basic Open Hearth Operation—By C. D. King. December, 1931—493.
Filtration as Applied to the Steel Industry—Air—By M. R. Robinson. January, 1931—15.
Fire Hydrants—Installation Use and Maintenance of—By G. C. Pfeffer. November, 1931—471.
Flexibility of Design in the Application of Ball and Roller Bearings to General Purpose Motors—By J. L. Brown. August, 1930—416.
Follansbee Brothers Company changes from 25 cycles to 60 cycles—Follansbee, W. Va., Plant of—By J. S. Murray. November, 1931—453.
Follansbee, W. Va.—Plant of the Follansbee Brothers Company Changes from 25 cycles to 60 cycles—By J. S. Murray. November, 1931—453.
Fuel Oil System—Great Lakes Steel Corporation, Ecorse, Michigan—By J. A. Clauss. February, 1931—49.
Furnace as a Metallurgical Tool in the Steel Industry—The Electric—By Charles McKnight. May, 1931—224.
Furnace Control—Discussion of Open Hearth—By M. Greenberg. October, 1930—487.
Furnace Control—Open Hearth—By M. J. Conway. June, 1931—289.
Furnace Control—Symposium on Open Hearth—October, 1930—479.
Furnace-Electrical Apparatus for the Coreless Induction—By N. R. Stansel. November, 1930—519.
Furnace in the Steel Industry—The Coreless Induction—By E. F. Northrup. May 1931—210.
Furnace Skip Hoist—Electrical Equipment to Operate the Blast—By C. P. Hamilton. March, 1931—139.
Furnaces—Automatic Combustion Control for Open Hearth—By R. W. Simpson. October, 1930—485.
Furnaces by the Temperature Difference Method—The Automatic Reversing of Open Hearth—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.
Furnaces—Combustion Control for Open Hearth—By P. S. Dickey. September, 1931—383.
Furnaces—Electrically Operated Equipment for Automatic Combustion Control of Open Hearth—By B. F. Keene. September, 1931—393.
Furnaces for Copper Brazing—Molybdenum Wound Hydrogen—By C. M. Thompson. September, 1930—471.
Furnaces for the Steel and Other Industries—Electrically Heated Annealing—By J. C. Woodson. March, 1931—122.
Furnaces in the Iron and Steel Industry—Machine Control of Combustion in Metallurgical—By J. F. Shadgen. October, 1930—490.
Furnaces with Atmospheric Control—Principles and Some Practical Applications of Electric—By A. N. Otis. August, 1931—352.

G

Gearing for Electric Overhead Traveling Cranes—Points to be Kept in Mind When Ordering Worm—November, 1931—468.
General Lubrication Committee—Report of A. I. & S. E. E.—By C. C. Pecu, Ch. June, 1931—264.
General Purpose D. C. Power in Large Industrial Plants—Conversion and Distribution of—By R. D. Abbiss and D. C. West. March, 1931—108.
General Purpose Motors—Flexibility of Design in the Application of Ball and Roller Bearings to—By J. L. Brown. August, 1930—416.
Good Housekeeping—By A. V. Berquist. December, 1931—509.
Graphical Carbon Balance of the Blast Furnace—By T. J. Ess. April, 1931—173.
Grease Drippage from Overhead Traveling Cranes—Spoilage of Material Due to—By T. J. Flahery. July, 1931—321.
Great Lakes Steel Corporation—Description of Equipment Installed at—December, 1930—570.
Great Lakes Steel Corporation—Ecorse, Michigan—Fuel Oil System—By J. A. Clauss. February, 1931—49.
Group vs. Individual Driven Rolling Mill Stands—By R. H. Ellis. August, 1930—429.

H

Hammer-Mill at Central Alloy Steel Company Improves Power Factor—Synchronous Motor Driving—By C. E. Buchan. September, 1930—469.
Hand Labor and Trucking—By J. A. Voss—December, 1931—513.
Happy Days Will Come Again—By Wray Dudley—January, 1931—1.
Health and Efficiency—The Application of the Health Lamp to the Iron and Steel Industry with Relation to—By M. J. Dorcas. December, 1931—501.
Health Lamp to the Iron and Steel Industry with Relation to Health and Efficiency—The Application of the—By M. J. Dorcas. December, 1931—501.
Heat Application—The Practical Side of Metallurgical—By H. Dobrin. June, 1931—256.
Heated Annealing Furnaces for the Steel and Other Industries—Electrically—By J. C. Woodson. March, 1931—122.
Heating Marches on—The Art of—By H. Dobrin. January, 1931—3.
Heating of Steel—Determinations of Time Required for the—By T. J. Ess. July, 1931—317.
Heavy Alternating Currents—Conductors of—By D. I. Bohn and H. W. Pabst. June, 1931—253.
Helpfulness—Mutual—By C. L. Collens. June, 1931—XII.
Hibbard Control System and Its Application to Synchronous Motors in the Steel Mills—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
Hoist—Electrical Equipment to Operate the Blast Furnace Skip—By C. P. Hamilton. March, 1931—139.
Hot Steel—Spraying System for Descaling—By J. E. Holveck. August, 1931—362.
Hot Strip Mills at the Wheeling Steel Corporation Steubenville Plant—Electrical Equipment of the Slabbing and—By James Farrington and H. A. Winne. July, 1931—323.
Housekeeping—Good—By A. V. Berquist. December, 1931—509.
Hydrants—Installation, Use and Maintenance of Fire—By G. C. Pfeffer. November, 1931—471.
Hydrogen Furnaces for Copper Brazing—Molybdenum Wound—By C. M. Thompson. September, 1930—471.

I

Improves Power Factor—Synchronous Motor Driving Hammer-Mill at Central Alloy Steel—By C. E. Buchan. September, 1930—469.
Individual A. C. Roll Table Drives—Recent Trends in—By R. M. Bayle. March, 1931—96.
Individual Driven Rolling Mill Stands—Group vs.—By R. H. Ellis. August, 1930—425.
Individual Drives for Table Rolls—By W. B. Snyder. March, 1931—93.
Induction Furnace—Electrical Apparatus for the Coreless—By N. R. Stansel. November, 1930—519.
Induction Furnace in the Steel Industry—The Coreless—By E. F. Northrup. May, 1931—210.
Industrial Plant—Economical Control of Purchased Electrical Power in the—By R. F. Gale. November, 1930—536.
Industrial Plants—Conversion and Distribution of General Purpose D. C. Power in Large—By R. D. Abbiss and D. C. West. March, 1931—108.
Industrial Power Applications—Membership of the—By the A. I. & S. E. E. and the A. I. E. E. March, 1931—105.
Industrial Safety Problems—Electricity and—By J. S. Murray. September, 1930—III.
Industrial Users—Interconnections of Power between Public Utilities and Large—By F. O. Schnure. March, 1931—106.
Industrials and the Interchange of Power between the Two Systems—Discussion of Papers on Inter-Connections between Public Utility and Large—By W. B. Skinkle. May, 1931—205.
Industries—Electrically Heated Annealing Furnaces for the Steel and Other—By J. C. Woodson. March, 1931—122.
Industry—Air Filtration as Applied to the Steel—By M. R. Robinson. January, 1931—15.
Industry—Brake Applications in the Steel—By R. M. Bayle. February, 1931—68.
Industry—Construction Program, 1930, Iron and Steel. January, 1931—40.
Industry During the Year 1930—Developments in the Application of Control Apparatus in the Iron and Steel—By P. B. Harwood. January, 1931—13.
Industry—Machine Control of Combustion in Metallurgical Furnaces in the Iron and Steel—By J. F. Shadgen. October, 1930—490.
Industry of Anti—Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special Study Regarding Operation in the Steel. July, 1931—II.
Industry—Safety in—By I. Lamont Hughes. December, 1930—566.
Industry—The Coreless Induction Furnace in the Steel—By E. F. Northrup. May, 1931—210.
Industry—The Electric Furnace as a Metallurgical Tool in the Steel—By Charles McKnight. May, 1931—224.
Industry—Through the Development of Rolling Mill Drives—Twenty Five Years Progress in the Steel—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.
Industry with Relation to Health and Efficiency—The Application of the Health Lamp to the Iron and Steel—By M. J. Dorcas. December, 1931—501.
Installed at Great Lakes Steel Corporation—Description of Equipment. December, 1930—570.
Installation—The Successful—By W. S. Hall. June, 1931—X.
Installation—Use and Maintenance of Fire Hydrants—By G. C. Pfeffer. November, 1931—471.
Interchange of Power Between the Two Systems—Discussion of Papers on Inter-Connection between Public Utilities and Large Industrials and the—By W. B. Skinkle. May, 1931—205.
Interconnection between the Duquesne Light Company and the Davidson Coke and Iron Company—By G. E. Dignan and R. L. Kirk. March, 1931—119.
Inter-Connections between Public Utility and Large Industrials and the Interchange of Power between the two Systems—Discussion of Papers on—By W. B. Skinkle. May, 1931—205.
Interconnections of Power Between Public Utilities and Large Industrial Users—By F. O. Schnure. March, 1931—106.
Internal Combustion Engines for Steel Mill Transportation—Locomotives with—By A. H. Candee. September, 1930—461.
Iron and Steel Industry—Construction Program—1930. January, 1931—40.
Iron and Steel Industry During the Year 1930—Developments in the Application of Control Apparatus to the—By P. B. Harwood. January, 1931—13.
Iron and Steel Industry—Machine Control of Combustion in Metallurgical Furnaces in the—By J. F. Shadgen. October, 1930—490.
Iron and Steel Industry with Relation to Health and Efficiency—The Application of the Health Lamp to the —By M. J. Dorcas. December, 1931—501.
Iron and Steel Plants—Discussion Oil Circuit Breaker Applications in—By B. M. Jones. April, 1931—158.
Iron and Steel—Trend of the Times in—September, 1931—III.
Iron Pipe—The Application of the Electric Motor to the Production of—Cast—By George C. Pfeffer. December, 1930—589.
Iron—The Manufacture of Acid Electric Steel and Cast—By H. H. Walther. October, 1931—415.

J

Joints—Dynamic Properties of Arc Welded—By C. H. Jennings. December, 1931—498.

L

Labor and Trucking—Hand—By J. A. Voss. December, 1931—513.

Lamp to the Iron and Steel Industry with Relation to Health and Efficiency—The Application of the Health—By M. J. Dorcas. December, 1931—501.

Large Industrial Plants—Conversion and Distribution of General Purpose D.C. Power in—By R. D. Abbiss and D. C. West. March, 1931—108.

Large Industrial Users—Interconnections of Power Between Public Utilities and—By F. O. Schnure. March, 1931—106.

Large Industrials and the Interchange of Power Between the Two Systems—Discussion of Papers on the Inter-Connections Between Public Utility and—By W. B. Skinkle. May, 1931—205.

Largest Mercury-Vapor Turbine Will be Erected in Schenectady—February, 1931—87.

Less Efficient—Are We Becoming—By F. R. Fishback. June, 1931—XVIII.

Life of Brake Linings and Wheels—By H. E. Hodgson. February, 1931—69.

Lighting in the Steel Plant—Series—By E. Anderson. August, 1931—350.

Linings and Wheels—Life of Brake—By H. E. Hodgson. February, 1931—69.

Locomotives with Internal Combustion Engines for Steel Mill Transportation—By A. H. Candee. September, 1930—461.

Lose in 1930—Did We—By F. W. Jessop. June, 1931—XVII.

Lubricants and Bearing Test Machine—By E. S. Glauch. March, 1931—129.

Lubricants on Power Consumption—Effect of Various—Rolling Mill Lubrication—By E. S. Glauch. May, 1931—215.

Lubricants—Testing of—By Frank I. Gray. June, 1931—251.

Lubricants—The Testing of—By E. S. Glauch. December, 1931—504.

Lubricating Systems for Roll Necks—Automatic Pressure—By Maurice Reswick. October, 1930—503.

Lubrication and Its Application to Machine Tools—By J. H. Van Campen. June, 1931—287.

Lubrication Committee—Report of A. I. & S. E. E. General—By C. C. Pecu, Ch. June, 1931—264.

Lubrication—Devices and Appliances for Steel Mill Roll Neck—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.

Lubrication Engineering Division's Questionnaire—Steel Mill Lubrication Practices—November, 1930—525.

Lubrication Engineering Division's Questionnaire—Tabulated Data in Connection with—October, 1931—422.

Lubrication—Everybody's Problem—August, 1930—III.

Lubrication of Ball and Roller Bearings in the Steel Mill—The—By D. E. Batesole. January, 1931—8.

Lubrication of Electrical Apparatus Used in Steel Mills—By J. L. Brown. June, 1931—266.

Lubrication Papers Presented at Twenty-Seventh Annual Convention of A. I. & S. E. E.—Discussion of—October, 1931—429.

Lubrication Practice—Elements of—December, 1930—582.

Lubrication Practice—Questionnaire on Steel Mill—By Lubrication Engineering Division. November, 1930—525.

Lubrication—Rolling Mill—Effect of Various Lubricants on Power Consumption—By E. S. Glauch. May, 1931—215.

Lubrication—Steam Turbine—By J. L. Roberts. August, 1931—374.

Lukens Steel Company—Developments in Products at—By J. H. McElhinney. January, 1931—6.

M

Machine Control of Combustion in Metallurgical Furnaces in the Iron and Steel Industry—By J. F. Shadgen. October, 1930—490.

Machine—Lubricants and Bearing Test—By E. S. Glauch. March, 1931—129.

Machine Tools—Lubrication and Its Application to—By J. H. Van Campen. June, 1931—287.

Magnetically Operated Brakes—By J. H. Hall. February, 1931—73.

Main Roll Drive Statistics, 1930—January, 1931—34.

Maintenance and Operation of an Electrical Department in a Modern Steel Mill—Report on Questionnaire Covering Organization—By J. J. Booth. August, 1930—405.

Maintenance of Fire Hydrants—Installation, Use and—By G. C. Pfeffer. November, 1931—471.

Manufacture of Acid Electric Steel and Cast Iron—The—By H. H. Walther. October, 1931—415.

Manufacture of Welding Wire—The—By G. S. Rose. May, 1931—227.

Manufacturers in Connection with Standardized Symbols for Control Apparatus—The A. I. & S. E. E. Suggestions to the Electrical—October, 1931—438.

Manufacturer's Opinion of the Value of Engineering Societies, Their Periodicals and Expositions—A—By William Lintern. June, 1931—XV.

Manufacturers—Questionnaire for Bearing—Special Study Regarding Operation of Anti-Friction Bearing Equipped Mill Type Motors—July, 1931—III.

Material Due to Grease Drippage from Overhead Traveling Cranes—Spoilage of—By T. J. Flaherty. July, 1931—321.

Measuring of Roll Pressures—By F. H. Buhlmann. November, 1930—532.

Mechanical Devices Used in Connection with Combustion Control Apparatus—Electrical versus—By W. M. Shallcross. September, 1931—397.

Mechanical Devices Used in Control and Regulation Engineering—Electrical vs.—By J. F. Shadgen. September, 1931—378.

Mercury Vapor Turbine Will be Erected in Schenectady—Largest—February, 1931—87.

Metallic Charge in Basic Open Hearth Operations—Some Factors Affecting Operating Economies—By C. D. King. December, 1931—493.

Metallurgical Furnaces in the Iron and Steel Industry—Machine Control of Combustion in—By J. F. Shadgen. October, 1930—490.

Metallurgical Heat Application—The Practical Side of—By H. Dobrin June, 1931—256.

Metallurgical Tool in the Steel Industry—The Electric Furnace as a—By Charles McKnight. May, 1931—224.

Method of Cupola Blowing—The Constant Air Weight—By H. V. Crawford. December, 1930—559.

Method—The Automatic Reversing of Open Hearth Furnaces by the Temperature Difference—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.

Mill at Central Alloy Steel Company Improves Power Factor—Synchronous Motor Driving Hammer—By C. E. Buchan. September, 1930—469.

Mill Drives—Motor and Control Apparatus for Cold Strip—By F. Mohler. June, 1931—272.

Mill Drives—Twenty-five Years Progress in the Steel Industry Through the Development of Rolling—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.

Mill Lubrication Practice—Questionnaire Steel—By Lubrication Engineering Division. November, 1930—525.

Mill Lubrication—Rolling—Effect of Various Lubricants on Power Consumption—By E. S. Glauch. May, 1931—215.

Mill—Report of Questionnaire Covering Organization, Maintenance and Operation of an Electrical Department in a Modern Steel—By J. J. Booth. August, 1930—405.

Mill Roll Neck Lubrication—Devices and Appliances for Steel—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.

Mill Stands—Group vs. Individual Driven Rolling—By R. H. Ellis. August, 1930—425.

Mill—The Lubrication of Ball and Roller Bearings in the Steel—By D. E. Batesole. January, 1931—8.

Mill Transportation—Locomotives with Internal Combustion Engines for Steel—By A. H. Candee. September, 1930—461.

Mill Type Motors—Questionnaire in Connection with a Special Study Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped—July, 1931—II.

Mill Type Motors—Special Study Regarding Operation of Anti-Friction Bearing Equipped—Questionnaire for Bearing Manufacturers—July, 1931—III.

Mills at the Wheeling Steel Corporation's Steubenville Plant—Electrical Equipment of the Slabbing and Hot Strip—By James Farrington and H. A. Winne. July, 1931—323.

Mills—Electrical Auxiliaries in Steel—By D. W. Dean. May, 1931—199.

Mills—Lubrication of Electrical Apparatus Used in Steel—By J. L. Brown. June, 1931—266.
Mills—Power Consumption Tests on the Timken Steel and Tube Company's Blooming and Bar—By Fred Waldorf. September, 1930—442.
Mills—Recent Developments in Sheet—November, 1931—III.
Mills—The Hibbard Control System and Its Application to Synchronous Motors in Steel—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
Mills—1930 Developments in Electrical Equipment for Steel—By H. A. Winne. 1931—21.
Modern Steel Plant—Report on Questionnaire Covering Organization, Maintenance and Operation of an Electrical Department in a—By J. J. Booth. August, 1930—405.
Molybdenum Wound Hydrogen Furnaces for Copper Brazing—By C. M. Thompson. September, 1930—471.
Motor and Control Apparatus for Cold Strip Mill Drives—By F. Mohler. June, 1931—272.
Motor Drive—Twin—By R. H. Wright and H. E. Stokes. June, 1931—246.
Motor Driving Hammer—Mill at Central Alloy Steel Company, Improves Power Factor—Synchronous—By C. E. Buchan. September, 1930—469.
Motor to the Production of Cast Iron Pipe—The Application of the Electric—By George C. Pfeffer. December, 1930—589.
Motors—Flexibility of Design in the Application of Ball and Roller Bearings to General Purpose—By J. L. Brown. August, 1930—416.
Motors for Auxiliary Drives—A Comparison of Alternating and Direct Current—By Gordon Fox. October, 1930—505.
Motors in Steel Mills—The Hibbard Control System and Its Application to Synchronous—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
Motors—Questionnaire in Connection with a Special Study Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type—July, 1931—II.
Motors—Special Study Regarding Operation of Anti-Friction Bearing Equipped Mill Type—Questionnaire for Bearing Manufacturers—July, 1931—III.
Motors—The Theory and Practice in Connection with the Application of Brakes to Crane—By A. J. Acker, R. J. Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.
Multi-Shift Buildings—Who Will Benefit from—By C. G. Palmer. November, 1931—478.
Mutual Helpfulness—By C. L. Collens. June, 1931—XII.

N

Neck Lubrication—Devices and Appliances for Steel Mill Roll—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.
Necks—Automatic Pressure Lubricating Systems for Roll—By Maurice Reswick. October, 1930—503.
Notes on Underground Cables—Some—By E. S. Simkins. January, 1931—32.

O

Oil Circuit Breaker Applications in Iron and Steel Plants—Discussion—By B. M. Jones. April, 1931—158.
Oil Circuit Breakers—The Selection of—By J. D. Greensward. April, 1931—155.
Oil System—Fuel—Great Lakes Steel Corporation, Ecorse, Mich.—By J. A. Clauss. February, 1931—49.
Open Hearth Combustion Control—By M. J. Conway. January, 1931—29.
Open Hearth Combustion Control—Discussion of Regulators for—By R. W. Simpson. September, 1931—399.
Open Hearth Control—By H. V. Flagg. October, 1930—480.
Open Hearth Furnace Control—By M. J. Conway. June, 1931—289.
Open Hearth Furnace Control—Discussion of—By M. Greenberg. October, 1930—487.
Open Hearth Furnace Control—Symposium on—October, 1930—479.
Open Hearth Furnaces by the Temperature Difference Method—The Automatic Reversing of—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.
Open Hearth Furnaces—Automatic Combustion Control for—By R. W. Simpson. October, 1930—485,
Open Hearth Furnaces—Combustion Control for—By P S. Dickey. September, 1931—383.
Open Hearth Furnaces—Electrically Operated Equipment for Automatic Combustion Control of—By B. F. Keene. September, 1931—393.
Open Hearth Operations—The Metallic Charge in Basic—Some Factors Affecting Operating Economy—By C. D. King. December, 1931—493.
Operate the Blast Furnace Skip Hoist—Electrical Equipment to—By C. P. Hamilton. March, 1931—139.
Operated Brakes—Magnetically—By J. H. Hall. February, 1931—73.
Operated Crane Statistics, 1930—Electrically—January, 1931—43.
Operated Equipment for Automatic Combustion Control for Open Hearth Furnace—Electrically—By B. F. Keene. September, 1931—393.
Operating Economies—Some Factors Affecting—The Metallic Charge in Basic Open Hearth Operations—By C. D. King. December, 1931—493.
Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special Study Regarding—July, 1931—II.
Operation of an Electrical Department in a Modern Steel Plant—Report of Questionnaire Covering Organization, Maintenance and—By J. J. Booth. August, 1930—405.
Operation of Anti-Friction Bearing Equipped Mill Type Motors—Special Study Regarding—Questionnaire for Bearing Manufacturers—July, 1931—III.
Operations—The Metallic Charge in Basic Open Hearth—Some Factors Affecting Operating Economies—By C. D. King. December, 1931—493.
Opinion of the Value of Engineering Societies, Their Periodicals and Expositions—A Manufacturer's—By William Lintern. June, 1931—XV.
Ordering Worm Gearing for Electric Overheard Traveling Cranes—Points to be Kept in Mind When—November, 1931—468.
Organization, Maintenance and Operation of an Electrical Department in Modern Steel Mill—Report on Questionnaire Covering—By J. J. Booth. August, 1930—405.
Other Industries—Electrically Heated Annealing Furnaces for the Steel and—By J. C. Woodson. March, 1931—122
Overhead Traveling Cranes—Points to be Kept in Mind When Ordering Worm Gearing for Electric—November, 1931—468.
Overhead Traveling Cranes—Spoilage of Material Due to Grease Drippage from—By T. J. Flaherty. July, 1931—321.

P

Papers on Inter-Connections Between Public Utility and Large Industrials and the Interchange of Power Between the Two Systems—Discussion of—By W. B. Skinkle. May, 1931—205.
Periodicals and Expositions—A Manufacturer's Opinion of the Value of Engineering Societies, Their—By William Lintern. June, 1931—XV.
Pipe—The Application of the Electric Motor to the Production of Cast Iron—By George C. Pfeffer. December, 1930—589.
Plant—Controlled Conditions—By H. E. Stitt. November, 1931—474.
Plant—Economical Control of Purchased Electrical Power in the Industrial—By R. F. Gale. November, 1930—536.
Plant—Series Lighting in the Steel—By E. Anderson. August, 1931—350.
Plant System Analysis—Steel—The Short Circuit Study—By M. J. Wohlgemuth. April, 1931—153.
Plant—Transportation Within the Steel—By D. M. Petty. December, 1930—573.
Plants—Conversion and Distribution of General Purpose D.C. Power in Large Industrial—By R. D. Abbiss and D. C. West. March, 1931—108.
Plants—Discussion—Oil Circuit Breaker Application in Iron and Steel—By B. M. Jones. April, 1931—158.
Plastic and Elastic Deformation—By E. Kieft. February, 1931—54.
Points to be Kept in Mind When Ordering Worm Gearing for Electric Overhead Traveling Cranes. November, 1931—468.
Policy—A Practical Sales—By R. D. Wood. December, 1931—508.
Possibilities—Welding and Its—By W. Sparagen. June, 1931—XIII.
Power—Absorption of By-Product—By A. Hoefle and W. T. Woodmancy. March, 1931—116.

Power Applications—Industrial—By the Membership of the A. I. & S. E. E. and the A. I. E. E. March, 1931—105.
Power Between Public Utilities and Large Industrial Users—Interconnections of—By F. O. Schnure. March, 1931—106.
Power Betweeen the Two Systems—Discussion of Papers on Inter-Connections Between Public Utilities and Large Industrials and the Interchange of—By W. B. Skinkle. May, 1931—205.
Power Consumption—Effect of Various Lubricants on—Rolling Mill Lubrication—By E. S. Glauch. May, 1931—215.
Power Consumption Tests on the Timken Steel and Tube Company's Blooming and Bar Mills—By Fred Waldorf. September, 1930—442.
Power Factor—Synchronous Motor Driving Hammer—Mill at Central Alloy Steel Company Improves—By C. E. Buchan. September, 1930—469.
Power in Large Industrial Plants—Conversion and Distribution of General Purpose D.C.—By R. D. Abbiss and D. C. West. March, 1931—108.
Power in the Industrial Plant—Economical Control of Purchased Electrical—By R. F. Gale. November, 1930—536.
Power—Prodigal—By F. O. Schnure. June, 1931—VII.
Practical Applications of Electric Furnaces with Atmospheric Control Principles and Some—By A. N. Otis. August, 1931—352.
Practical Sales Policy—A—By R. D. Wood. December, 1931—508.
Practical Side of Metallurgical Heat Application—The—By H. Dobrin. June, 1931—256.
Practice—Elements of Lubrication—December, 1930—582.
Practice in Connection With the Application of Brakes to Crane Motors—The Theory and—By A. J. Acker, R. J Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.
Practice—Questionnaire in Steel Mill Lubrication—By Lubrication Engineering Division. November, 1930—525.
Preliminary Report of the A. I. & S. E. E., Special Committee on Bearings—By F. D. Egan. June, 1931—298.
Pressure Lubricating Systems for Roll Necks—Automatic—By Maurice Reswick. October, 1930—503.
Pressures—Measuring of Roll—By F. H. Buhlmann. November, 1930—532.
Principles and Some Practical Applications of Electric Furnaces with Atmospheric Control—By A. N. Otis. August, 1931—352.
Problem—Lubrication—Everybody's—August, 1930—III.
Problems—Electricity and Industrial Safety—By J. S. Murray. September, 1930—III.
Process—An Electrical Development Which is Producing Quality and Uniformity of Product in the Bessemer—By R. S. McCaffrey. November, 1931—467.
Prodigal Power—By F. O. Schnure. June, 1931—VII.
Producing Quality and Uniformity of Product in the Bessemer Process—An Electrical Development Which is—By R. S. McCaffrey. November, 1931—467.
Product in the Bessemer Process—An Electrical Development Which is Producing Quality and Uniformity of—By R. S. McCaffrey. November, 1931—467.
Products at Lukens Steel Company—Developments in—By J. H. McElhinney. January, 1931—6.
Production of Cast Iron Pipe—The Application of the Electric Motor to the—By George C. Pfeffer. December, 1930—589.
Program, 1930—Iron and Steel Industry—Construction—January, 1931—40.
Progress in the Steel Industry Through the Development of Rolling Mill Drives—Twenty-five Years—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.
Properties of Arc Welded Joints—Dynamic—By C. H. Jennings. December, 1931—498.
Public Utilities and Large Industrial Users—Interconnections of Power Between—By F. O. Schnure. March, 1931—106.
Public Utility and Large Industrials and the Interchange of Power Between the Two Systems—Discussion of Papers on Inter-Connections Between—By W. B. Skinkle. May, 1931—205.
Purchased Electrical Power in the Industrial Plant—Economical Control of—By R. F. Gale. November, 1930—536.

Q

Quality and Uniformity of Product in the Bessemer Process—An Electrical Development Which is Producing—By R. S. McCaffrey. November, 1931—467.
Questionnaire Covering Organization, Maintenance and Operation of an Electrical Department in a Modern Steel Mill—Report on—By J. J. Booth. August, 1930—405.
Questionnaire for Bearing Manufacturers, Special Study Regarding Operation of Anti-Friction Bearing Equipped Mill Type Motors. July, 1931—III.
Questionnaire in Connection with a Special Study Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors. July, 1931—II.
Questionnaire on Steel Mill Lubrication Practice—By Lubrication Engineering Division. November, 1930—525.
Questionnaire—Tabulated Data in Connection with Lubrication Engineering Division's—October, 1931—422.

R

Reaction and Temperature—By M. J. Conway. August, 1930—425.
Records—Cost—By R. F. Sanner. January, 1931—5.
Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special Study—July, 1931—II.
Regarding Operation of Anti-Friction Bearing Equipped Mill Type Motors—Special Study—Questionnaire for Bearing Manufacturers—July, 1931—III.
Regulation Engineering—Electrical vs. Mechanical Devices Used in Control and—By J. F. Shadgen. September, 1931—378.
Regulators for Open Hearth Combustion Control—Discussion of—By R. W. Simpson. September, 1931—399.
Relation to Health and Efficiency—The Application of the Health Lamp to the Iron and Steel Industry with—By M. J. Dorcas. December, 1931—501.
Report of A. I. & S. E. E., General Lubrication Committee—By C. C. Pecu, Ch. June, 1931—264.
Report of the A. I. & S. E. E. Special Committee on Bearings—Preliminary—By F. D. Egan. June, 1931—298.
Report on Questionnaire Covering Organization, Maintenance and Operation of an Electrical Department in a Modern Steel Mill—By J. J. Booth. August, 1930—405.
Report, 1930-31—A. I. & S. E. E. Electrical Development Committee—By W. H. Burr, Ch. June, 1931—233.
Required for Heating of Steel—Determinations of Time—By T. J. Ess. July, 1931—317.
Research Covering Alternating Current Arc Welding—By G. A. Hughes and R. C. McBride. June, 1931—241.
Reversing of Open Hearth Furnaces by the Temperature Difference Method—The Automatic—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.
Review of Combustion Engineering—A—January, 1931—25.
Rods—Copper Alloy Welding—By I. T. Hook. July, 1931—337.
Roll Drive Statistics, 1930—Main—January, 1931—34.
Roll Neck Lubrication—Devices and Appliances for Steel Mill—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.
Roll Necks—Automatic Pressure Lubricating Systems for—By Maurice Reswick. October, 1930—503.
Roll Pressures—Measuring of—By F. H. Buhlmann. November, 1930—532.
Roll Table Drives—By F. E. Harrell. March, 1931—97.
Roll Table Drives—Recent Trends in Individual A.C.—By R. M. Bayle. March, 1931—96.
Roller Bearings in the Steel Mill—The Lubrication of Ball and—By D. E. Batesole. January, 1931—8.
Roller Bearings to General Purpose Motors—Flexibility of Design in the Application of Ball and—By J. L. Brown. August, 1930—416.
Rolling Mill Drives—Twenty-five Years Progress in the Steel Industry Through the Development of—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.
Rolling Mill Lubrication—Effect of Various Lubricants on Power Consumption—By E. S. Glauch. May, 1931—215.
Rolling Mill Stands—Group vs. Individual Driven—By R. H. Ellis. August, 1930—425.
Rolls—Individual Drives for Table—By W. B. Snyder. March, 1931—93.

S

Safety in Industry—By I. Lamont Hughes. December, 1930—566.
Safety—Problems—Electricity and Industrial—By J. S. Murray. September, 1930—III.
Sales Policy—A Practical—By R. D. Wood. December, 1931—508.

Schenectady—Largest Mercury Vapor Turbine will be Erected in—February, 1931—87.
Selection of Oil Circuit Breakers—The—By J. D. Greensward. April, 1931—155.
Series Brakes on Anti-Friction Bearing Equipped Trolleys? —Shunt or—By W. C. Raube. February, 1931—76.
Series Lighting in the Steel Plant—By E. Anderson. August, 1931—350.
Sheet Mills—Recent Developments in—November, 1931—III.
Shift Buildings—Who Will Benefit from Multi—By C. G. Palmer. November, 1931—478.
Short Circuit Study—The—Steel Plant System Analysis—By M. J. Wohlgemuth. April, 1931—153.
Shunt or Series Brakes on Anti-Friction Bearing Equipped Trolleys?—By W. C. Raube. February, 1931—76.
Sixty Cycles—Follansbee, W. Va., Plant of the Follansbee Brothers Company Changes from Twenty-five Cycles to —By J. S. Murray. November, 1931—453.
Skip Hoist—Electrical Equipment to Operate the Blast Furnace—By C. P. Hamilton. March, 1931—139.
Slabbing and Hot Strip Mills at the Wheeling Steel Corporation's Steubenville Plant—Electrical Equipment of the—By James Farrington and H. A. Winne. July, 1931—323.
Societies, Their Periodicals and Expositions—A Manufacturer's Opinion of the Value of Engineering—By William Lintern. June, 1931—XV.
Special Study Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a—July, 1931—II.
Special Study Regarding Operation of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire for Bearing Manufacturers—July, 1931—III.
Specifications—A. I. & S. E. E. Crane—November, 1930 —545.
Spoilage of Material Due to Grease Drippage from Overhead Traveling Cranes—By T. J. Flaherty. July, 1931 —321.
Spraying System for Descaling Hot Steel—By J. E. Holveck. August, 1931—362.
Standardized Symbols for Control Apparatus—The A. I. & S. E. E. Suggestions to the Electrical Manufacturers in Connection with—October, 1931—438.
Stands—Group vs. Individual Driven Rolling Mill—By R. H. Ellis. August, 1930—425.
Station Power to Steel Mills—Application of Central—By T. E. Tynes. 1916—41.
Statistics, 1930—Electrically Operated Crane—January, 1931 —43.
Statistics, 1930—Main Roll Drive—January, 1931—34.
Steam Turbine Lubrication—By J. L. Roberts. August, 1931—374.
Steel and Cast Iron—The Manufacture of Acid Electric—By H. H. Walther. October, 1931—415.
Steel and Other Industries—Electrically Heated Annealing Furnaces for the—By J. C. Woodson. March, 1931—122.
Steel—Determinations of Time Required for the Heating of—By T. J. Ess. July, 1931—317.
Steel in Detroit—By J. A. Clauss. January, 1931—31.
Steel Industry—Air Filtration as Applied to the—By M. R. Robinson. January, 1931—15.
Steel Industry—Brake Applications in the—By R. M. Bayle. February, 1931—68.
Steel Industry—Construction Program, 1930—Iron and— January, 1931—40.
Steel Industry During the Year 1930—Developments in the Application of Control Apparatus in the Iron and—By P. B. Harwood. January, 1931—13.
Steel Industry—Machine Control of Combustion in Metallurgical Furnaces in the Iron and—By J. F. Shadgen. October, 1930—490.
Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special Study Regarding Operation in the—July, 1931—II.
Steel Industry—The Coreless Induction Furnace in the—By E. F. Northrup. May, 1931—210.
Steel Industry—The Electric Furnace as a Metallurgical Tool in the—By Charles McKnight. May, 1931—224.
Steel Industry Through the Development of Rolling Mill Drives—Twenty-five Years Progress in the—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.
Steel Industry with Relation to Health and Efficiency—The Application of the Health Lamp to the Iron and—By M. J. Dorcas. December, 1931—501.
Steel Mill Lubrication Practice—Questionnaire on—By Lubrication Engineering Division. November, 1930—525.
Steel Mill—Report of Questionnaire Covering Organization, Maintenance and Operation of an Electrical Department in a Modern—By J. J. Booth. August, 1930 —405.
Steel Mill Roll Neck Lubrication—Devices and Appliances for—By R. C. McDaniel, W. D. Hodson, A. J. Jennings, H. J. Anderson, M. Reswick, George P. Dempler and M. J. Helmes. April, 1931—178.
Steel Mill—The Lubrication of Ball and Roller Bearing in the—By D. E. Batesole. January, 1931—8.
Steel Mill Transportation—Locomotives with Internal Combustion Engines for—By A. H. Candee. September, 1930—461.
Steel Mills—Electrical Auxiliaries in—By D. W. Dean. May, 1931—199.
Steel Mills—Lubrication of Electrical Apparatus Used in—By J. L. Brown. June, 1931—266.
Steel Mills—The Hibbard Control System and Its Application to Synchronous Motors in—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
Steel Mills—1930 Developments in Electrical Equipment for —By H. A. Winne. January, 1931—21.
Steel Plant—Series Lighting in the—By E. Anderson. August, 1931—350.
Steel Plant System Analysis—The Short Circuit Study—By M. J. Wohlgemuth. April, 1931—153.
Steel Plant—Transportation Within the—By D. M. Petty. December, 1930—573.
Steel Plants—Discussion Oil Circuit Breaker Applications In Iron and—By B. M. Jones. April, 1931—158.
Steel—Spraying System for Descaling Hot—By J. E. Holveck. August, 1931—362.
Steel—Trend of the Times in Iron and—September, 1931 —III.
Steubenville Plant—Electrical Equipment of the Slabbing and Hot Strip Mills at the Wheeling Steel Corporation's—By James Farrington and H. A. Winne. July, 1931—323.
Strip Mill Drives—Motor and Control Apparatus for Cold —By F. Mohler. June, 1931—272.
Strip Mills at the Wheeling Steel Corporation's Steubenville Plant—Electrical Equipment of the Slabbing and Hot—By James Farrington and H. A. Winne. July, 1931—323.
Study Regarding Operation in the Steel Industry of Anti-Friction Bearing Equipped Mill Type Motors—Questionnaire in Connection with a Special—July, 1931—II.
Study Regarding Operation of Anti-Friction Bearing Equipped Mill Type Motors—Special Questionnaire for Bearing Manufacturers—July, 1931—III.
Study—The Short Circuit—Steel Plant System Analysis—By M. J. Wohlgemuth. April, 1931—153.
Successful Installation—The—By W. S. Hall. June, 1931 —X.
Suggestions to Electrical Manufacturers in Connection with Standardized Symbols for Control Apparatus—The A. I. & S. E. E.—October, 1931—438.
Symbols for Control Apparatus—The A. I. & S. E. E. Suggestion to the Electrical Manufacturers in Connection with Standardized—October, 1931—438.
Symposium on Open Hearth Furnace Control. October, 1930—479.
Synchronous Motor Driving Hammer—Mill at Central Alloy Steel Company, Improves Power Factor—By C. E. Buchan. September, 1930—469.
Synchronous Motors in the Steel Mills—The Hibbard Control System and Its Application to—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
System Analysis—Steel Plant—The Short Circuit Study—By M. J. Wohlgemuth. April, 1931—153.
System and Its Application to Synchronous Motors in the Steel Mills—The Hibbard Control—By W. H. Feldmann and S. P. Bordeau. December, 1931—483.
System for Descaling Hot Steel—Spraying—By J. E. Holveck. August, 1931—362.
Systems—Discussion of Papers on Interconnections Between Public Utility and Large Industrials and the Interchange of Power Between the Two—By W. B. Skinkle. May, 1931—205.
System—Fuel Oil—Great Lakes Steel Corporation, Ecorse, Mich.—By J. A. Clauss. February, 1931—49.
Systems for Roll Necks—Automatic Pressure Lubricating—By Maurice Reswick. October, 1930—503.

T

Table Rolls—Individual Drives for—By W. B. Snyder. March, 1931—93.

Table Drives—Recent Trends in Individual A.C. Roll—By R. M. Bayle. March, 1931—96.

Table Drives—Roll—By F. E. Harrell. March, 1931—97.

Tabulated Data in Connection with Lubrication Engineering Division's Questionnaire. October, 1931—422.

Temperature Difference Method—The Automatic Reversing of Open Hearth Furnaces by the—By M. J. Bradley and J. W. Kinnear, Jr. October, 1930—481.

Temperature—Reaction and—By M. J. Conway. August, 1930—425.

Test Machine—Lubricants and Bearing—By E. S. Glauch. March, 1931—129.

Testing of Lubricants—By Frank L. Gray. June, 1931—251.

Testing of Lubricants—The—By E. S. Glauch. December, 1931—504.

Tests on the Timken Steel and Tube Company's Blooming and Bar Mills—Power Consumption—By Fred Waldorf. September, 1930—442.

Theory and Practice in Connection With the Application of Brakes to Crane Motors—By A. J. Acker, R. J. Wadd, L. W. White and G. W. Baumgarten. February, 1931—78.

Time Required for the Heating of Steel—Determinations of—By T. J. Ess. July, 1931—317.

Times in Iron and Steel—Trend of the—September, 1931—III.

Timken Steel and Tube Company's Blooming and Bar Mills—Power Consumption Tests on the—By Fred Waldorf. September, 1930—442.

Tool in the Steel Industry—The Electric Furnace as a Metallurgical—By Charles McKnight. May, 1931—224.

Tools—Lubrication and Its Application to Machine—By J. H. Van Campen. June, 1931—287.

Transportation—Locomotives with Internal Combustion Engines for Steel Mill—By A. H. Candee. September, 1930—461.

Transportation Within the Steel Plant—By D. M. Petty. December, 1930—573.

Traveling Cranes—Points to be Kept in Mind When Ordering Worm Gearing for Electric Overhead—November, 1931—468.

Traveling Cranes—Spoilage of Material Due to Grease Drippage from Overhead—By T. J. Flaherty. July, 1931—321.

Trend of the Times in Iron and Steel. September, 1931—III.

Trends in Individual A.C. Roll Table Drives—Recent—By R. M. Bayle. March, 1931—96.

Trolleys—Shunt or Series Brakes on Anti-Friction Bearing Equipped—By W. C. Raube. February, 1931—76.

Trucking—Hand Labor and—By J. A. Voss. December, 1931—513.

Turbine Lubrication—Steam—By J. L. Roberts. August, 1931—374.

Turbine will be Erected in Schenectady—Largest Mercury Vapor—February, 1931—87.

Twenty-five Cycles to Sixty Cycles—Follansbee, W. Va., Plant of the Follansbee Brothers Company Changes from—By J. S. Murray. November, 1931—453.

Twenty-five Years Progress in the Steel Industry Through the Development of Rolling Mill Drives—Utilization of Electricity—By Wilfred Sykes. June, 1931—XI.

Twin Motor Drive—By R. H. Wright and H. E. Stokes. June, 1931—246.

Two Systems—Discussion of Papers on Inter-Connections Between Public Utility and Large Industrials and the Interchange of Power Between the—By W. B. Skinkle. May, 1931—205.

U

Underground Cables—Some Notes on—By E. S. Simkins. January, 1931—32.

Uniformity of Product in the Bessemer Process—An Electrical Development Which is Producing Quality and—By R. S. McCaffrey. November, 1931—467.

Use and Maintenance of Fire Hydrants—Installation—By G. C. Pfeffer. November, 1931—471.

Used in Connection with Combustion Control Apparatus—Electrical versus Mechanical Devices—By W. M. Shallcross. September, 1931—397.

Used in Control and Regulation Engineering—Electrical vs. Mechanical Devices—By J. F. Shadgen. September, 1931—378.

Used in Steel Mills—Lubrication of Electrical Apparatus—By J. L. Brown. June, 1931—266.

Users—Interconnections of Power Between Public Utilities and Large Industrial—By F. O. Schnure. March, 1931—106.

Utilities and Large Industrial Users—Interconnections of Power Between Public—By F. O. Schnure. March, 1931—106.

Utility and Large Industrials and the Interchange of Power Between the Two Systems—Discussion of Papers on Inter-Connections Between Public—By W. B. Skinkle. May, 1931—205.

Utilization of Electricity—Twenty-five Years Progress in the Steel Industry Through the Development of Rolling Mill Drives—By Wilfred Sykes. June, 1931—XI.

V

Value of Engineering Societies, Their Periodicals and Expositions—A Manufacturer's Opinion of the—By William Lintern. June, 1931—XV.

Vapor Turbine will be Erected in Schenectady—Largest Mercury—February, 1931—87.

Ventilation—Air Conditioning and—By W. H. Burr. August, 1931—349.

W

We Becoming Less Efficient?—Are—By F. R. Fishback. June, 1931—XVIII.

We Lose in 1930—Did—By F. W. Jessop. June, 1931—XVII.

Weight—Method of Cupola Blowing—The Constant Air—By H. V. Crawford. December, 1930—559.

Welcomes the A. I. & S. E. E.—Cleveland—By P. C. Clark. June, 1931—XV.

Weld Cranes—Why Arc—By H. T. Florence. August, 1930—421.

Welded Joints—Dynamic Properties of Arc—By C. H. Jennings. December, 1931—498.

Welding—By A. B. Arganbright. August, 1931—360.

Welding and Its Possibilities—By W. Sparagen. June, 1931—XIII.

Welding—Arc—November, 1931—470.

Welding—Research Covering Alternating Current Arc—By G. A. Hughes and R. C. McBride. June, 1931—241.

Welding Rods—Copper Alloy—By I. T. Hook. July, 1931—337.

Welding Wire—The Manufacture of—By G. S. Rose. May, 1931—227.

Wheeling Steel Corporation's Steubenville Plant—Electrical Equipment of the Slabbing and Hot Strip Mills at the—By James Farrington and H. A. Winne. July, 1931—323.

Wheels—Life of Brake Linings and—By H. E. Hodgson. February, 1931—69.

Who Will Benefit from Multi-Shift Buildings—By C. G. Palmer. November, 1931—478.

Why Arc Weld Cranes—By H. T. Florence. August, 1930—421.

Within the Steel Plant—Transportation—By D. M. Petty. December, 1930—573.

Wire—The Manufacture of Welding—By G. S. Rose. May, 1931—227.

Worm Gearing for Electric Overhead Traveling Cranes—Points to be Kept in Mind When Ordering—November, 1931—468.

Wound Hydrogen Furnaces for Copper Brazing—Molybdenum—By C. M. Thompson. September, 1930—471.

SPECIAL MAGNETIC CONTROL COMMITTEE

The Association of Iron & Steel Electrical Engineers has appointed Mr. E. L. Upp, Superintendent, Electrical Department, National Tube Company, at McKeesport, Pa., to act as Chairman of the Special Magnetic Control Committee.

This Committee's program will involve studies in connection with the following:

1. Standardization of Control Symbols.
2. Method of Indicating Switches, Coils and Interlocks.
3. Distinction between Power and Control Wiring.
   a. Method of Layout and marking Lines, representing Control and Power Circuits.
   b. Method of showing connection between Panel and Master Controller, etc.
4. Should wiring on panels be shown front or rear view?
5. Information and Data that should be included on Diagram, such as Resistance Data, Key to all Symbols.
6. Size of Diagrams and Drawings.
7. Standardized locations for Line and Control Wire Terminals.
8. Standardized methods of Rating Contactors.
9. Specifications or Guide Forms for purchasing of Magnetic Control, such as Plain Reversing, Reversing with Dynamic Braking in the OFF Position, Crane Bridge, Crane Hoist, etc.

The Engineers and Superintendents of the following Steel Plants have been appointed to assist in the collaboration of data for this work:

C. J. Smith, Elec. Engr., Illinois Steel Co., Chicago, Ill.

E. C. Marshall, Elec. Supt., Youngstown Sheet & Tube Co., Gary, Ind.

R. E. Lewis, Ch. Elec., Youngstown Sheet & Tube Co., Youngstown, Ohio.

J. I. Kaspari, Elec. Engr., Weirton Steel Co., Weirton, W. Va.

D. I. Bohn, Elec. Engr., Aluminum Company of America, Pittsburgh, Pa.

F. D. Egan, Elec. Supt., Bethlehem Steel Co., Lackawanna, N. Y.

H. F. Raab, Asst. Elec. Supt., Bethlehem Steel Co., Johnstown, Pa.

J. R. Barefoot, Asst. Elec. Supt., Carnegie Steel Co., Munhall, Pa.

R. F. Sanner, Asst, Elec. Supt., Carnegie Steel Co., Duquesne, Pa.

J. W. Bates, Elec. Engr., American Sheet & Tin Plate Co., Pittsburgh, Pa.

W. H. Burr, Elec. Supt., Lukens Steel Co., Coatesville, Pa.

J. O'Malia, Ch. Elec., Otis Steel Company, Cleveland, Ohio.

W. W. Garrett, Engr. of Tests, Elec. Lab., Tennessee Coal, Iron & R. R. Company, Fairfield, Ala.

O. H. Meineke, Ch. Elec., Spang Chalfant & Co., Ambridge, Pa.

W. F. Riggs, Elec. Supt., Jones & Laughlin Steel Corp., S. S. Works, Pittsburgh, Pa.

M. H. Morgan, Jr., Engr. Dept., Carnegie Steel Co., Braddock, Pa.

C. H. Verwohlt, Works Engr., Wheeling Steel Corp., Wheeling, W. Va.

G. Gage, American Rolling Mill Co., Butler, Pa.

J. B. Sullivan, Elec. Supt., A. M. Byers Co., Ambridge, Pa.

J. Moloney, Ch. Elec., Superior Steel Corp., Carnegie, Pa.

J. D. Kelvie, Ch. Elec., Republic Steel Corp., Massillon, Ohio.

L. M. Ripple, Elec. Supt., Great Lakes Steel Corp., Ecorse, Mich.

W. A. Perry, Supt. Elec. & Pwr. Depts., Inland Steel Co., East Chicago, Ind.

F. H. Kittredge, Elec. Engr., Illinois Steel Co., Joliet, Ill.

J. S. Delaney, Ch. Elec., Granite City Steel Co., Granite City, Ill.

C. T. Phillips, Elec. Supt., Sloss Sheffield Steel Corp., Kansas City, Mo.

I. N. Tull, Elec. Engr., Corrigan-McKinney Steel Co., Cleveland, Ohio.

R. S. Hurtt, Elec. Dept., Pittsburgh Crucible Steel Co., Midland, Pa.

F. A. Snyder, Elec. Engr., American Steel & Wire Co., Cleveland, Ohio.

E. L. Anderson, Elec. Dept., Bethlehem Steel Co., Sparrows Point, Md.

Iron and Steel Industry Construction Program 1931

Rolling Mills Completed 1931

COLD STRIP MILLS

16" Cold Strip Mill	1
26" Four High Cold Strip Mill	4
16" Four High Cold Strip Mill	4
Four High Cold Strip Mill	1
TOTAL	10

STECKEL STRIP MILLS

7½" Steckel Strip Mill	2
TOTAL	2

BAR MILLS

10" Alloy Bar Mill	1
10" Bar Mill	1
TOTAL	2

BLOOMING MILLS

Blooming Mill	1
44" Blooming Mill	2
TOTAL	3

UNIVERSAL MILLS

40" Universal Mill	1
TOTAL	1

MERCHANT MILLS

10" Merchant Mill	2
Merchant Mill (Replaced)	1
TOTAL	3

PLATE MILLS

160" Plate Mill	1
Plate Strip Mill	2
96" Continuous Plate Mill	1
TOTAL	4

HOT TIN MILLS

28" Hot Tin Mills	2
TOTAL	2

BEAM MILLS

Beam Mill	1
TOTAL	1

SEAMLESS TUBE MILLS

Seamless Tube Mill	1
TOTAL	1

ELECTRIC WELD TUBE MILL

Electric Weld Tube Mill	1
TOTAL	1

PLUG MILL

Plug Mill	1
TOTAL	1

BILLET MILL

24" Billet Mill	1
TOTAL	1

ROD MILLS

Rod Mills	2
TOTAL	2

DISTRIBUTION OF COMPLETED ROLLING MILLS AS PER STATES

▲

PENNSYLVANIA

Four High Cold Strip Mill	1
Rod Mills	2
24" Billet Mill	1
Merchant Mill (Replacement)	1
Blooming Mill	1
TOTAL	6

OHIO

26" Four High Cold Strip Mills	4
16" Four High Cold Strip Mills	4
7½" Steckel Strip Mill	1
10" Merchant Mill	1
Electric Weld Tube Mill	1
Plug Mill	1
TOTAL	12

MASSACHUSETTS

7½" Steckel Strip Mill	1
TOTAL	1

MARYLAND

40" Universal Mill	1
160" Plate Mill	1
TOTAL	2

ILLINOIS

28" Hot Tin Mills	2
44" Blooming Mill	1
Beam Mill	1
96" Continuous Plate	1
10" Alloy Bar	1
TOTAL	6

INDIANA

44" Blooming Mill	1
Seamless Tube Mill	1
TOTAL	2

MICHIGAN

10" Merchant Mill	1
TOTAL	1

ALABAMA

Plate Strip Mill	2
TOTAL	2

MISSOURI

10" Bar Mill	1
TOTAL	1

CONNECTICUT

16" Cold Strip Mill	1
TOTAL	1

Construction Program 1932

Rolling Mills Under Construction

COLD STRIP MILLS

54" 4 high Cold Strip Mills	7
42" 4 high Cold Strip Mills	3
72" 4 high Cold Strip Mills	2
4 high Cold Strip Mills	2
8" Cold Strip Mills	2
TOTAL	16

HOT STRIP MILLS

10" Hot Strip Mills	1
TOTAL	1

HOT PLATE STRIP MILL

76" Hot Plate Strip Mill	1
72" Hot Plate Strip Mill	1
TOTAL	2

PUSH BENCH TUBE

Push Bench Tube	1
TOTAL	1

ELECTRIC WELD TUBE

Electric Weld Tube Mill	1
TOTAL	1

DISTRIBUTION OF ROLLING MIILS UNDER CONSTRUCTION AS PER STATES

PENNSYLVANIA

10" Hot Strip Mill	1
8" Cold Strip Mill	2
Push Bench Tube	1
Electric Weld Tube	1
TOTAL	5

INDIANA

76" Hot Plate Strip Mill	1
54" 4 high Cold Strip Mills	7
42" 4 high Cold Strip Mills	3
4 high Cold Strip Mill	1
TOTAL	12

OHIO

72" Hot Plate Strip Mill	1
72" 4 high Cold Strip Mill	2
4 high Cold Strip Mill	1
TOTAL	4

ITEMS OF INTEREST

PERSONNEL CHANGES.

▲

Carl Thompson, superintendent of the New Castle, Pa., works of American Sheet & Tin Plate Company, Pittsburgh, subsidiary of United States Steel Corporation, has become acting general superintendent of the Laughlin works, Martins Ferry, O. He succeeds E. A. Machin, on leave of absence due to illness.

Harold Pyle, assistant manager of the Laughlin works, has been transferred to the New Castle works.

▲

D. W. Dean has recently been appointed manager of the Control Section of the Industrial Department of the Westinghouse Electric and Manufacturing Company to succeed the late W. H. MacGillivray. In 1922, he became a member of the Steel Mill Section of the General Engineering Department, a position he held until his recent appointment. He is a member of the Association of Iron and Steel Electrical Engineers, serving on several important committees and is the author of a number of papers on control equipment which have been published in the Iron and Steel Engineer and various other magazines.

J. E. Dunn has been appointed combustion engineer at the A. M. Byers Company plant at Ambridge, Pa. Mr. Dunn was formerly combustion engineer at the Republic Steel Corporation, at Youngstown, O. He is a member of the A. I. & S. E. E. Combustion Engineering Division and his many friends wish him success in his new connection.

▲

Henry H. Timken, Jr., has been made assistant to the president of The Timken Steel & Tube Company, Canton, O., it was announced by Fred J. Griffiths, president of the company. He has been serving in the capacity of assistant works manager of The Timken Roller Bearing Company for the past two years.

▲

Combustion Engineering Corporation, New York, announces that J. D. Harrison, district manager of the Chicago office from 1922 to 1929, has been reappointed to that position effective January 1, with offices in Bankers Building, Adams and Clark streets, Chicago. Mr. Harrison will succeed Hugh R. Carr, who has been transferred to the Sales Department of the home office at New York as manager of stoker sales.

After spending several months in the Engineering Department of the Rollway Bearing Company, Inc., of Syracuse, N. Y., E. C. Bonistall, formerly connected with the Engineering Department of the Pennsylvania Railroad at Altoona, has been given charge of the Cincinnati District office, taking in Cincinnati and surrounding territory.

▲

Effective January 1, T. E. Beasley assumed charge of Sundh Electric sales, replacing H. J. Kaufman of the Chicago office of the Sundh Electric Company and The Clark Controller Company, 333 North Michigan avenue, Chicago, Ill.

▲

J. K. B. Hare, whose headquarters with the Westinghouse Electric and Manufacturing Company, until recently have been in New York, has been appointed transpotration manager of the Westinghouse Central District and will now be located in the Grant Building, Pittsburgh.

▲

William E. Umstattd has been made executive vice president of The Timken Roller Bearing Company, Canton, O. Mr.Umstattd has been with the Timken organization for thirteen years, during the last two years of which he has occupied the capacity of factory manager.

▲

John Anderson, assistant to J. G. Barry, vice president, has been appointed secretary of the sales committee of the General Electric Company, it was announced by Mr. Barry. Mr. Anderson succeeds E. G. Waters, who is retiring at his own request on the completion of more than 42 years continuous service, the past 25 being as secretary of the sales committee.

▲

Announcement has been made by the Westinghouse Electric and Manufacturing Company that John E. Barkle has been appointed general manager of the South Philadelphia works, located at Essington, Pa.

▲

Walter C. Carroll, formerly vice president of the Inland Steel Company, Chicago, and later president of the Oil Well Supply Company, Pittsburgh, has become associated with the American Sheet & Tin Plate Company, Pittsburgh. Mr. Carroll was identified with the American Sheet & Tin Plate Company for more than 20 years prior to his joining the Inland company.

▲

Three new faces make their appearance among the group of Baker-Raulang Company engineers; all are faces of successful material handling men who have been selected or relocated to give to truck users the full value of their exceptional knowledge and experience. R. A. Clark comes to Boston to serve the New England States with headquarters at 260 Park Square Building. Frank E. Witte and H. S. Fuller take up Baker-Raulang sales and service work on the Pacific Coast. Mr. Witte is president of the company which bears his name—the Frank E. Witte Company, of 1061 Howard street, San Francisco. The office of Mr. Fuller is at 810 Terminal Sales Building, Seattle, Wash.

C. Lewis Hull, sales manager, Switch and Panel Division of the Square D Company, announces the appointment of C. W. Bates, formerly Chicago branch manager of the company, as assistant sales manager. G. S. Blomgren of the Chicago office succeeds Mr. Bates as Chicago branch manager. Mr. Bates' headquarters will be at the Detroit factory of the Square D Company.

▲

Rockbestos Products Corporation, manufacturers of asbestos insulated electric wires and cables, announces the appointment of Merton R. Sumner as their manager of their Chicago sales office at 718 Madison Terminal Building. Mr. Sumner was formerly with the Byllesby Engineering & Management Company in Pittsburgh.

▲

Henry H. Peck, formerly with the Standard Steel Works Company of Burnham, Pa., has joined Lukenweld, Inc., Coatesville, Pa., as manager of sales. Mr. Peck succeeds John S. Bleecker, formerly in charge of sales for Lukenweld, Inc. Mr. Bleecker has been appointed manager of sales research and advertising for Lukens Steel Company and its divisions, Lukenweld, Inc., and By-Products Steel Corporation.

▲

The Clark Controller Company of Cleveland, O., has assumed the entire management of the business of Una Welding, Inc., also of Cleveland. Una Welding, Inc., is the new corporate name of the formerly well known Una Welding and Bonding Company, manufacturers of Electric Arc Welding equipment.

Mr. E. A. Hurme, former Pittsburgh district manager for Clark Controller, has been appointed assistant sales manager in charge of Una sales. This move officially effective January, 1932.

OBITUARIES

▲

W. A. Young, associated with the Harnischfeger Corporation, Milwaukee, Wis., as chief engineer for the past 21 years, died on December 23. Mr. Young was known as one of the outstanding authorities on material handling applications. He was a prominent member of the A. I. & S. E. E. and was well known throughout the metal trade industries. Funeral services were held at his former home in Cuyahoga Falls, Ohio. ▲

W. B. Chapman, former president of The Chapman Engineering Company of Mt. Vernon, Ohio, died December 16 at Chicago. He was inventor of the gas producer bearing his name. After serving as president of the Chapman company, he retained his position as an officer when the firm was enlarged into the Chapman-Stein Company. He continued with his old organization when Chapman-Stein was absorbed by the Surface Combustion Company of Toledo and was still connected with the work at the time of his death. ▲

Hugh P. Tiemann, assistant metallurgical engineer of the Carnegie Steel Company, died January 4 in Pittsburgh from an illness which had its inception in burns received November 28.

"We Greatly Reduce Our Installation Costs

Distribution System with this Electrical

Put BULL DOG on the Job

and its Flexible, Mobile Construction Will Meet Our Changing Needs"

You, also, can cut maintenance costs by adopting the most up-to-date Electrical Distribution System.

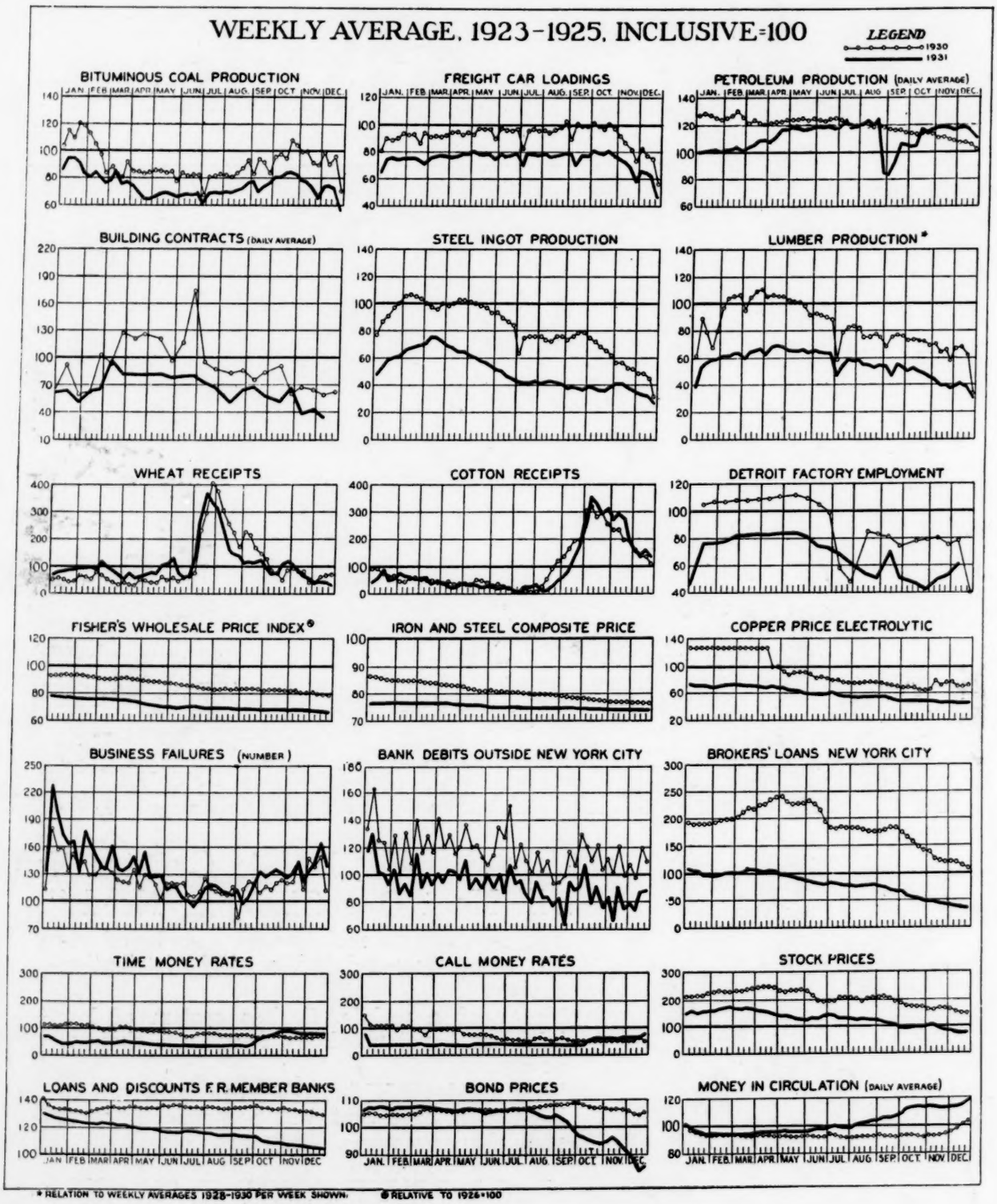
You need a mobile, flexible system of low initial cost, yet providing for future changes or expansions.

Why not let BULL DOG work with you to build a system that will economically meet your changing needs for years to come?

BULL DOG ELECTRIC PRODUCTS COMPANY
Detroit, Michigan

OVER 25 YEARS OF RESEARCH AND DEVELOPMENT

BUSINESS INDICATORS—1930—1931*



*United States Department of Commerce Survey of Current Business.